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RESEARCH AND DEVELOPMENT REPORTS

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U.S. GOVERNMENT RESEARCH & DEVELOPMENT REPORTS

Vol. 70, No. 24 December 25, 1970

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U. S. Government Research & Development Reports (USGRDR) is a semimonthly abstract journal published by the National Technical Information Service (NTIS). *USGRDR* announces business, scientific and technical information released to the public through the National Technical Information Service by U. S. Government Departments and Agencies. U. S. Government-sponsored translations and some foreign reports written in English are included. Most documents announced in *USGRDR* are for sale to the public at a nominal service charge.

Translations can be identified in *USGRDR* by accession numbers prefixed by the letters "TT", "JPRS", or by a "PB" number followed by the letter "T"; or by a descriptive note in the cataloging information.

22 SUBJECT CATEGORIES

In the body of the journal, reports are announced in 22 subject categories called "Fields." Each Field is divided into subcategories called "Groups." The subject arrangement follows the *COSATI Subject Category List* (AD-612 200). An edge index on the back cover provides easy access to the Fields within the journal.

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A typical entry includes the title (in bold face type), basic bibliographic information, descriptive terms, an abstract in most cases, the accession number, and price. Typical entries are shown on page iv.

No abstracts are given at this time for AEC and NASA reports, instead the reader is referred to the journal of original announcement—*Nuclear Science Abstracts (NSA)* or *Scientific & Technical Aerospace Reports (STAR)*. When machine conversion programs are complete, AEC and NASA abstracts will be included.

Descriptors and identifiers provide added subject definition. Descriptors considered of most value appear first in parentheses with their modifiers. Descriptors and open-end identifiers preceded by an asterisk are included in the subject index.

Reports covering more than one subject are announced in the primary field and cross-referenced to other fields.

A Locator List at the end of the journal gives the COSATI Field/Group location of each report cited in this issue.

The American Society for Testing and Materials (ASTM) Coden, a unique five-letter code for periodical titles designed to aid mechanical and electronic storage and retrieval of information, is included on the cover of the journal.

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All reports announced in *USGRDR* are indexed by subject, personal author, corporate author, contract/grant number, and accession/report number in *U.S. Government Research & Development Reports Index*. The Index is published semi-monthly and sold on subscription at $22 a year ($27.50 foreign) or single copy at $3. Order from the National Technical Information Service, Springfield, Virginia 22151, or through your Department of Commerce Field Office.

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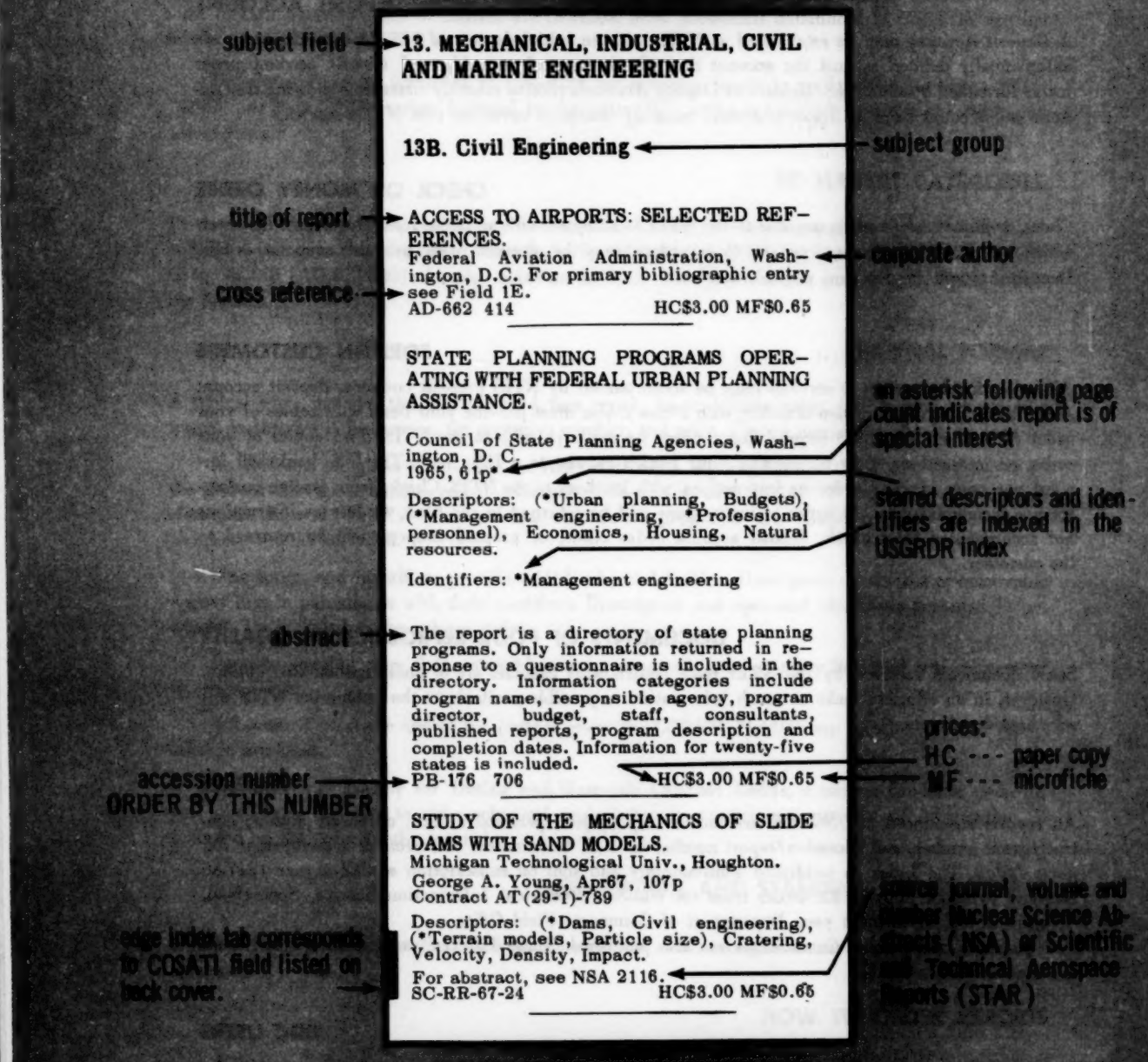
subject field
13. MECHANICAL, INDUSTRIAL, CIVIL AND MARINE ENGINEERING
13B. Civil Engineering
subject group
title of report
ACCESS TO AIRPORTS: SELECTED REFERENCES.
Federal Aviation Administration, Washington, D.C. For primary bibliographic entry
corporate author
cross reference
see Field 1E.
AD-662 414
HC$3.00 MF$0.65
STATE PLANNING PROGRAMS OPERATING WITH FEDERAL URBAN PLANNING ASSISTANCE.
Council of State Planning Agencies, Washington, D. C.
1965, 61p*
an asterisk following page count indicates report is of special interest
Descriptors: (*Urban planning, Budgets), (*Management engineering, *Professional personnel), Economics, Housing, Natural resources.
starred descriptors and identifiers are indexed in the USGRDR index
Identifiers: *Management engineering
abstract
The report is a directory of state planning programs. Only information returned in response to a questionnaire is included in the directory. Information categories include program name, responsible agency, program director, budget, staff, consultants, published reports, program description and completion dates. Information for twenty-five states is included.
prices:
HC --- paper copy
MF --- microfiche
accession number
ORDER BY THIS NUMBER
PB-176 706
HC$3.00 MF$0.65
STUDY OF THE MECHANICS OF SLIDE DAMS WITH SAND MODELS.
Michigan Technological Univ., Houghton.
George A. Young, Apr67, 107p
Contract AT(29-1)-789
Descriptors: (*Dams, Civil engineering), (*Terrain models, Particle size), Cratering, Velocity, Density, Impact.
source journal, volume and number Nuclear Science Abstracts (NSA) or Scientific and Technical Aerospace Reports (STAR)
For abstract, see NSA 2116.
edge index tab corresponds to COSATI field listed on back cover.
SC-RR-67-24
HC$3.00 MF$0.65

SUBJECT FIELD AND GROUP STRUCTURE

(Use Edge Index on back cover to locate subject Field in the journal)

FIELD 1. AERONAUTICS

Includes the following Groups: Aerodynamics; Aeronautics; Aircraft; Aircraft Flight Control and Instrumentation; Air Facilities.

FIELD 2. AGRICULTURE

Includes the following Groups: Agricultural Chemistry; Agricultural Economics; Agricultural Engineering; Agronomy and Horticulture; Animal Husbandry; Forestry.

FIELD 3. ASTRONOMY AND ASTROPHYSICS

Includes the following Groups: Astronomy; Astrophysics; Celestial Mechanics.

FIELD 4. ATMOSPHERIC SCIENCES

Includes the following Groups: Atmospheric Physics; Meteorology.

FIELD 5. BEHAVIORAL AND SOCIAL SCIENCES

Includes the following Groups: Administration and Management; Documentation and Information Technology; Economics; History, Law, and Political Science; Human Factors Engineering; Humanities; Linguistics; Man-machine Relations; Personnel Selection, Training, and Evaluation; Psychology (Individual and Group Behavior); Sociology.

FIELD 6. BIOLOGICAL AND MEDICAL SCIENCES

Includes the following Groups: Biochemistry; Bioengineering; Biology; Bionics; Clinical Medicine; Environmental Biology; Escape, Rescue, and Survival; Food, Hygiene and Sanitation; Industrial (Occupational) Medicine; Life Support; Medical and Hospital Equipment; Microbiology; Personnel Selection and Maintenance (Medical); Pharmacology; Physiology; Protective Equipment; Radiobiology; Stress Physiology; Toxicology; Weapon Effects.

FIELD 7. CHEMISTRY

Includes the following Groups: Chemical Engineering; Inorganic Chemistry; Organic Chemistry; Physical Chemistry, Radio and Radiation Chemistry.

FIELD 8. EARTH SCIENCES AND OCEANOGRAPHY

Includes the following Groups: Biological Oceanography; Cartography; Dynamic Oceanography; Geochemistry; Geodesy; Geography; Geology and Mineralogy; Hydrology and Limnology; Mining Engineering; Physical Oceanography; Seismology; Snow, Ice, and Permafrost; Soil Mechanics; Terrestrial Magnetism.

FIELD 9. ELECTRONICS AND ELECTRICAL ENGINEERING

Includes the following Groups: Components; Computers; Electronic and Electrical Engineering; Information Theory; Subsystems; and Telemetry.

FIELD 10. ENERGY CONVERSION (Non-propulsive)

Includes the following Groups: Conversion Techniques; Power Sources; Energy Storage.

FIELD 11. MATERIALS

Includes the following Groups: Adhesives and Seals; Ceramics, Refractories, and Glasses; Coatings, Colorants, and Finishes; Composite Materials; Fibers and Textiles; Metallurgy and Metallography; Miscellaneous Materials; Oils, Lubricants, and Hydraulic Fluids; Plastics; Rubbers; Solvents, Cleaners, and Abrasives; Wood and Paper Products.

FIELD 12. MATHEMATICAL SCIENCES

Includes the following Groups: Mathematics and Statistics; Operations Research.

FIELD 13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING

Includes the following Groups: Air Conditioning, Heating, Lighting, and Ventilating; Civil Engineering; Construction Equipment, Materials, and Supplies; Containers and Packaging; Couplings, Fittings, Fasteners, and Joints; Ground Transportation Equipment; Hydraulic and Pneumatic Equipment; Industrial Processes; Machinery and Tools; Marine Engineering; Pumps, Filters, Pipes, Fittings, Tubing, and Valves; Safety Engineering; Structural Engineering.

FIELD 14. METHODS AND EQUIPMENT

Includes the following Groups: Cost Effectiveness; Laboratories, Test Facilities, and Test Equipment; Recording Devices; Reliability; Reprography.

FIELD 15. MILITARY SCIENCES

Includes the following Groups: Antisubmarine Warfare; Chemical, Biological, and Radiological Warfare; Defense; Intelligence; Logistics; Nuclear Warfare; Operations, Strategy, and Tactics.

FIELD 16. MISSILE TECHNOLOGY

Includes the following Groups: Missile Launching and Ground Support; Missile Trajectories; Missile Warheads and Fuses; Missiles.

FIELD. 17. NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES

Includes the following Groups: Acoustic Detection; Communications; Direction Finding; Electromagnetic and Acoustic Countermeasures; Infrared and Ultraviolet Detection; Magnetic Detection; Navigation and Guidance; Optical Detection; Radar Detection; Seismic Detection.

FIELD 18. NUCLEAR SCIENCE AND TECHNOLOGY

Includes the following Groups: Fusion Devices (Thermonuclear); Isotopes; Nuclear Explosions; Nuclear Instrumentation; Nuclear Power Plants; Radiation Shielding and Protection; Radioactive Wastes and Fission Products; Radioactivity; Reactor Engineering and Operation; Reactor Materials; Reactor Physics; Reactors (Power); Reactors (Non-power); SNAP Technology.

FIELD 19. ORDNANCE

Includes the following Groups: Ammunition, Explosives, and Pyrotechnics; Bombs; Combat Vehicles; Explosions, Ballistics, and Armor; Fire Control and Bombing Systems; Guns; Rockets; Underwater Ordnance.

FIELD 20. PHYSICS

Includes the following Groups: Acoustics; Crystallography; Electricity and Magnetism; Fluid Mechanics; Masers and Lasers; Optics; Particle Accelerators; Particle Physics; Plasma Physics; Quantum Theory, Solid Mechanics; Solid-state Physics; Thermodynamics; Wave Propagation.

FIELD 21. PROPULSION AND FUELS

Includes the following Groups: Air-breathing Engines; Combustion and Ignition; Electric Propulsion; Fuels; Jet and Gas Turbine Engines; Nuclear Propulsion; Reciprocating Engines; Rocket Motors and Engines; Rocket Propellants.

FIELD 22. SPACE TECHNOLOGY

Includes the following Groups: Astronautics; Spacecraft; Spacecraft Trajectories and Reentry; Spacecraft Launch Vehicles and Ground Support.

R&D REPORTS AND TRANSLATIONS

1. AERONAUTICS

1A. Aerodynamics

INTERACTION OF A SPHERICAL SOURCE FLOW WITH A RAREFIED ATMOSPHERE.
Purdue Univ Lafayette Ind Project Squid Headquarters
For primary bibliographic entry see Field 20D.
AD-713 122 HC$3.00 MF$0.65

TAETIGKEITSBERICHTE 1969. FAHGEBIET 1: STROEMUNGSMECHANIK (Activity Report 1969. Division 1: Fluid Mechanics),
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Porz-Wahn (West Germany)
For primary bibliographic entry see Field 20D.
AD-713 207

TAETIGKEITSBERICHTE 1969. FACHGEBIET 2: FLUGMECHANIK, FLUGFUEHRUNG (Activity Report 1969. Division 2: Flight Mechanics, Flight Control),
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Porz-Wahn (West Germany)
Hermann Blenk, Werner Schulz, Karl Heinrich Doetsch, Walter Just, and Gerhard Bruening.
1969, 41p
Text in German.
Availability: Pub. in Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt-Jahresbericht 1969 41p. No copies furnished.

Descriptors: (*Flight, *Aerodynamics), (*Flight control systems, Scientific research), Rotary wings, West Germany.

Der Inhalt: Institut fur Flugmechanik; Institut fur Flugfuhrung; Institut fur Drehflugelflugzeuge; Institut fur Dynamik der Flugsysteme.
AD-713 208

A VORTEX WAKE MODEL FOR OPTIMUM HEAVILY LOADED DUCTED FANS,
Georgia Inst of Tech Atlanta
Robin B. Gray, and Terry Wright. 25 Jul 69, 11p
AROD-T-2:14-E
Contract DAHC04-68-C-0004
Presented at the AIAA/AHS VTOL Research, Design, and Operations Meeting, Atlanta, Ga. 17-19 Feb 69, Paper No. 69-222. Revision of report dated 6 Mar 69.
Availability: Pub. in Jnl. of Aircraft, v7 n2 p152-158 Mar/Apr 70.

Descriptors: (*Ducted fans, *Vortices), Wake, Mathematical models, Optimization, Aerodynamic loading, Propellers (Aerial).

Like the free propeller in axial flight, a single-rotation ducted fan of highest induced efficiency is characterized by an ultimate wake vortex system shed from the blade trailing edges whose apparent motion is that of rigid helical surfaces. In addition and concentric with this inner sheet, there is a cylindrical surface of helical vortex filaments shed from the duct trailing edge. For zero hub diameter, and neglecting compressibility, viscosity, and tip clearance, a consistent mathematical model of the constant-diameter vortex wake is developed and the compatibility relationships to be satisfied are presented. Using the Biot-Savart equation, the vortex strength distribution in the wake may be determined by numerical methods and then related to the blade bound vortex strength. Some preliminary results of the analysis are presented for the lightly loaded case for comparison with existing methods. (Author)
AD-713 224

RESULTS OF TRAILING VORTEX STUDIES IN A TOWING TANK,
Boeing Scientific Research Labs Seattle Wash
For primary bibliographic entry see Field 20D.
AD-713 496 HC$3.00 MF$0.65

THE INTERNAL AND EXTERNAL FLOW FIELD ASSOCIATED WITH PARACHUTES DURING INFLATION,
Army Natick Labs Mass
For primary bibliographic entry see Field 1C.
AD-713 520 HC$3.00 MF$0.65

AN INVESTIGATION OF A SUPERSONIC SURFACE JET-HYPERSONIC FLOW INTERACTION WITH AXIAL SYMMETRY.
Boeing Scientific Research Labs Seattle Wash
For primary bibliographic entry see Field 20D.
AD-713 603 HC$3.00 MF$0.65

A COMPACT THRUST AUGMENTING EJECTOR EXPERIMENT.
Aerospace Research Labs Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 20D.
AD-713 634 HC$3.00 MF$0.65

RESEARCHES ON THE PROPAGATION AND DECAY OF VORTEX RINGS.
Aerospace Research Labs Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 20D.
AD-713 705 HC$3.00 MF$0.65

DYNAMIC VISCOUS PRESSURE INTERACTION IN HYPERSONIC FLOW,
National Aeronautical Establishment Ottawa (Ontario)
For primary bibliographic entry see Field 20D.
AD-713 717 HC$3.00 MF$0.65

THE CALCULATION OF ADIABATIC LAMINAR BOUNDARY LAYER SHOCK WAVE INTERACTIONS IN AXI-SYMMETRIC FLOW. PART I. HOLLOW CYLINDER-FLARE BODIES WITH ZERO SPIN.
Technical note,
von Karman Inst. for Fluid Dynamics, Rhode-Saint-Genese (Belgium).
Harry P. Horton. May 70, 68p VKI-TN-63
Grant EOOAR-68-0026
Distribution Limitation now Removed.

Descriptors: (*Laminar boundary layer, *Shock waves), Interactions, Axially symmetric flow, Adiabatic gas flow, Cylindrical bodies, Flared afterbodies, Secondary flow, Two-dimensional flow, Supersonic flow, Mathematical models, Mach number, Belgium.
Identifiers: Lees-Reeves-Klineberg method, Syvertson-Dennis shock expansion method.

A method is described for calculating the overall properties of flare-induced laminar boundary layer shock wave interactions on axi-symmetric bodies at zero incidence, under adiabatic conditions. The method consists of an extension to axi-symmetric flow of the two-dimensional integral boundary layer method of Lees and Reeves. In the improved form recently developed by Klineberg, the relationship between the local slope of the displacement surface and the external Mach number is calculated by a suitable inversion of the second-order shock-expansion method of Syvertson and Dennis. Satisfactory agreement is demonstrated between the theory and measurements on hollow cylinder-flare models at Mach numbers of 2, 2 and 4.0. (Author)
AD-873 051 HC$3.00 MF$0.65

METHOD OF CHARACTERISTICS FOR ONE-DIMENSIONAL FLOW WITH CHEMICAL REACTION,
Los Alamos Scientific Lab., N. Mex.
W. Fickett, J. D. Jacobson, and W. W. Wood. Aug 69, 57p
Contract W-7405-eng-36

Descriptors: (*One dimensional flow, Chemical reactions), Computer programming, Shock waves, Approximation.
Identifiers: Method of characteristics.

For abstract, see NSA 24 20.
LA-4269 HC$3.00 MF$0.65

SMALL OSCILLATIONS OF A VISCOUS ISOTHERMAL ATMOSPHERE.
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
R. M. Myers. Aug 70, 245p NASA-TM-X-58051

Descriptors: *Differential equations, *Isothermal flow, *Two dimensional flow, *Viscous flow, *Wave equations, Compressible flow, Inviscid flow, Problem solving, Stratified flow.

For abstract, see STAR 08 21.
N70-38131 HC$3.00 MF$0.65

NONLINEAR ACTUATOR DISK THEORY AND FLOW FIELD CALCULATIONS, INCLUDING NONUNIFORM LOADING.
For primary bibliographic entry see Field 20D.
For abstract, see STAR 08 21.
N70-38435 HC$3.00 MF$0.65

GRADIENT SHOCK TUBES WITH STRONG INCIDENT SHOCK WAVES IN HYDROGEN,
Sandia Labs., Albuquerque, N. Mex.
D. A. Freiwald. Aug 70, 40p

Descriptors: (*Shock waves, *Hydrogen), Shock tubes, Propagation, Interactions.

For abstract, see NSA 24 20.
SC-RR-70-537 HC$3.00 MF$0.65

1B. Aeronautics

FLIGHT EVALUATION OF THE EFFECTS OF SHORT PERIOD FREQUENCY AND NORMAL ACCELERATION RESPONSE IN CARRIER APPROACH.
Final rept. Apr-Jun 69,
Princeton Univ N J Dept of Aerospace and Mechanical Sciences
Edward Seckel, and George E. Miller. Nov 69, 37p
Rept no. 882
Contract Nonr-1858 (50), Grant NSF-GP-579

Descriptors: (*Approach, *Carrier landings), Flight testing, Pitch (Motion), Aircraft carriers, Frequency, Acceleration, Lift.

The results of an aircraft flying qualities research program are presented. Navy test pilot evaluations in the form of pilot ratings and specific comments of several longitudinal handling characteristics were obtained for a simulated carrier landing task. The investigation made use of a variable stability aircraft which accurately simulated the longitudinal short period response characteristics and the effects of atmospheric turbulence. The flying qualities associated with variations in short period frequency, lift curve slope, and the use of direct lift control are presented. The data are compared with similar data obtained from flight and ground simulator tests. All configurations tested were found to be acceptable for the daylight visual carrier approach task, and only minor differences in the flying qualities of the configurations were evident. (Author)
AD-713 125 HC$3.00 MF$0.65

INDEX OF NAFEC TECHNICAL REPORTS, 1967-1969.
Final rept.
National Aviation Facilities Experimental Center Atlantic City N J
Oct 70, 61p Rept no. FAA-NA-70-67

Descriptors: (*Aeronautics, Bibliographies), (*Indexes, Reports), (*Reports, *Bibliographies), Abstracts, Aircraft.

The report is an index of all technical reports which were assigned NA numbers and published by NAFEC during the period 1967 through 1969. Entries are arranged by NA number and include titles, authors and full abstracts. Separate sections contain indexes by subject, author, RD number, DS number, project number, contract number and AD number. (Author)
AD-713 176 HC$3.00 MF$0.65

TAETIGKEITSBERICHTE 1969. FACHGEBIET 5: ELEKTRONIK (Activity Report 1969. Division 5. Electronics),
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Porz-Wahn (West Germany)
For primary bibliographic entry see Field 9C.
AD-713 211

SOVIET CIVIL AIR TRANSPORT: AN APPRAISAL,
Army Command and General Staff Coll Fort Leavenworth Kans
Gilbert E. Jones. May 70, 121p

Descriptors: (*Civil aviation, *USSR), Air transportation, Commercial planes, Jet transport planes, Supersonic planes, Aircraft industry, Reviews, Theses.
Identifiers: Supersonic transports.

The purpose of the study is to provide a comprehensive description of civil air transport in the USSR and to offer an appraisal of its contemporary status. Although a brief historical sketch of Soviet civil aviation has been included, the study concentrates on the 1960-1970 period. The organizational structure, operational procedures, the commercial aircraft inventory, and the prospects for future development are the major features of Soviet civil air transport that are examined. (Author)
AD-713 415 HC$3.00 MF$0.65

ALL-WEATHER, LOW-LEVEL NAVIGATION.
Ohio Univ Athens Dept of Electrical Engineering
For primary bibliographic entry see Field 17G.
AD-713 420 HC$3.00 MF$0.65

ANTICOLLISION LIGHTS FOR THE SUPERSONIC TRANSPORT (SST),
Federal Aviation Administration Washington D C Office of Aviation Medicine
For primary bibliographic entry see Field 1C.
AD-713 488 HC$3.00 MF$0.65

EFFECTS OF ALCOHOL ON MEMORY AND ITS IMPLICATIONS FOR FLYING SAFETY,
School of Aerospace Medicine Brooks AFB Tex
For primary bibliographic entry see Field 6E.
AD-713 611

A SUMMARY OF AIRLINE WEATHER-RADAR OPERATIONAL POLICIES AND PROCEDURES.
Air Weather Service Scott AFB Ill
For primary bibliographic entry see Field 4B.
AD-713 636 HC$3.00 MF$0.65

AIRCRAFT INCIDENT REPORT, BOEING 747, N732PA, RENTON AIRPORT, RENTON, WASHINGTON, DECEMBER 13, 1969.
National Transportation Safety Board, Washington, D.C. Bureau of Aviation Safety.

26 Aug 70, 31p NTSB-AAR-70-19, File-5-0046
Also available on subscription, $12.00/year domestic, $15.00/year foreign.

Descriptors: (*Aviation accidents, *Accident investigations), Washington (State), Approach, Passenger aircraft, Commercial aircraft.
Identifiers: Boeing 747 aircraft.

N732PA was being operated on December 13, by the Boeing Company, Seattle, Washington, for the purpose of ferrying the aircraft from Boeing Field, Seattle, Washington, to the Renton Airport. During an approach to a landing at Renton, the aircraft struck an embankment approximately 20 feet short of the threshold of Runway 15. The ground contact point was approximately 30 inches below the top of the bank and the runway level. The aircraft came to a stop on the centerline of Runway 15, approximately 3,500 feet beyond the threshold. The incident occurred at 1111 P.s.t. on December 13, 1969. Eleven persons were on board, including the crew. None was injured. Small fires broke out in the No. 3 engine wing strut and the No. 4 engine forward of the tail cone. These were immediately extinguished. Structural damage was confined to the right wing landing gear, right flap assemblies, and the Nos. 3 and 4 engines and their cowlings. The Board determines that the probable cause of this incident was the premature touchdown of the aircraft during a visual approach to a relatively short runway, induced by the pilot's not establishing a glidepath which would assure runway threshold passage with an adequate safety margin, under somewhat unusual environmental and psychological conditions. (Author)
PB-195 193 HC$3.00 MF$0.65

AIRCRAFT ACCIDENT REPORT. OZARK AIR LINES, INC., DOUGLAS DC-9-15, N974Z, SIOUX CITY AIRPORT, SIOUX CITY, IOWA, DECEMBER 27, 1968
National Transportation Safety Board, Washington, D.C. Bureau of Aviation Safety.

2 Sep 70, 43p NTSB-AAR-70-20, File 1-0039
Also available on subscription, $12.00/year domestic, $15.00/year foreign.

Descriptors: (*Aviation accidents, *Accident investigations), Passenger aircraft, Commercial aircraft, Iowa, Takeoff, Stalling, Ice formation.
Identifiers: DC-9 aircraft.

At approximately 0711 c.s.t. on December 27, 1968, Ozark Air Lines Flight 982, a Douglas DC-9, crashed while taking off from the Sioux City Airport, Sioux City, Iowa. There were no fatalities. Among the 64 passengers and four crewmembers, 10 passengers were hospitalized with minor injuries and three crewmembers received serious injuries. The aircraft was destroyed in the crash. There was no fire. The Safety Board determines that the probable cause of this accident was a stall near the upper limits of ground effect, with subsequent loss of control as a result of the aerodynamic and weight penalties of airfoil icing. The flightcrew failed to have the airfoil ice removed prior to the attempted takeoff from Sioux City. The Board also finds that the crew selected an improper takeoff thrust for the existing gross weight condition of the aircraft. (Author)
PB-195 194 HC$3.00 MF$0.65

1C. Aircraft

COMPILATION AND ANALYSIS OF FLIGHT CONTROL SYSTEM COMMAND INPUTS.
Final rept. 1 May 64-30 Apr 65,
Systems Technology, Inc., Hawthorne, Calif.
David H. Weir. Jan 66, 73p STI-TR-142-1 AFFDL-TR-65-119
Contract AF 33 (615)-1818
Distribution Limitation now Removed.

Descriptors: (*Flight control systems, Data processing systems), Automatic pilots, Input-Output devices, Command + Control systems, Approximation (Mathematics), Terrain, Analysis, Design, Automatic, Instrument flight, Instrument landings.

Flight control command input data are presented for automatic approach and landing, automatic terrain following, and manual control. The data are reduced to analytical forms useful in preliminary design where possible, e.g., servoanalysis methods and approximation techniques appropriate to the use of the data are discussed. Preferred data forms and areas of continuing data need are summarized. (Author)
AD-483 621 HC$3.00 MF$0.65

DESIGN OF WOOD AIRCRAFT STRUCTURES.
Munitions Board, Washington, D.C. Aircraft Committee.
Jun 51, 234p ANC-18
Distribution Limitation now Removed.

Descriptors: (*Wood, *Aircraft), Plywood, Mechanical properties, Airframes, Wings, Aerodynamic control surfaces, Fuselages.

The bulletin has been prepared for use in the design of both military and commercial aircraft. Technical material in the bulletin pertains to three related phases of the structural design of wood aircraft. Information is presented on the strength and elastic properties of structural elements constructed of wood and plywood. Suggested methods are given for structural analysis for the design of various aircraft components. Although these methods are in many cases the same as those used for metal structures, special considerations have been introduced which take into account the orthotropic properties of wood. Recommendations are presented on the detail structural design of wood aircraft and contains some examples of how various manufacturers have treated the solution of specific detail design problems.
AD-490 100 HC$3.00

A FLIGHT SIMULATOR STUDY OF STOL TRANSPORT LATERAL CONTROL CHARACTERISTICS.
Final rept.,
Douglas Aircraft Co Long Beach Calif
Douglas E. Drake, Robert A. Berg, Gary L. Teper, and W. AllenShirley. Sep 70, 125p* FAA-RD-70-61
Contract DOT-FA69WA-2186

Descriptors: (*Short take-off planes, Flight control systems), (*Flight control systems, *Roll), Flight simulators, Transport planes, Stabilization systems, Standards.
Identifiers: Breguet 941 aircraft.

A systematic investigation was conducted of STOL transport terminal area lateral control characteristics to identify the significant considerations and establish appropriate lateral control criteria. The investigation consisted of an analysis of applicable existing data and a moving-base flight simulator test program using the NASA Ames Research Center S-16 Moving Cab Transport Simulator. The flight simulator program covered a wide range of vehicle aerodynamic and physical characteristics representative of practical STOL transports ranging in size from 25,000 to 130,000 pounds. (Author)
AD-713 138 HC$3.00 MF$0.65

FORMAT-FORTRAN MATRIX ABSTRACTION TECHNIQUE. VOLUME VI. SUPPLEMENT I. DESCRIPTION OF DIGITAL COMPUTER PROGRAM. PHASE I. EXTENDED.
Douglas Aircraft Co Long Beach Calif
For primary bibliographic entry see Field 20K.
AD-713 149 HC$3.00 MF$0.65

DESIGN AND MANUFACTURE OF COMPOSITE, ISOTENSOID, NATURAL SHAPE BALLOONS.
Final rept. May 66-Sep 69,
Schjeldahl (G T) Co Northfield Minn
James B. Munson. 15 Dec 69, 71p Rept no. 0034
AFCRL-70-0498

Contract AF 19 (628)-5987

Descriptors: (*Balloons, Design), Inflatable structures, Composite materials, Filament wound construction, Fibers, Stresses, Flight testing.
Identifiers: *Isotensoid structures.

A method is presented for arranging filamentary, load bearing material to approximate a constant stress condition in the gas envelope of a free floating balloon for the purpose of maximizing structural efficiency. A relation between material distribution and envelope stress was obtained. Manufacturing equipment was developed and a natural shape, zero pressure constant stress balloon was fabricated and tested. (Author)
AD-713 188 HC$3.00 MF$0.65

TAETIGKEITSBERICHTE 1969. FACHGEBIET 2: FLUGMECHANIK, FLUGFUEHRUNG (Activity Report 1969. Division 2: Flight Mechanics, Flight Control),
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Porz-Wahn (West Germany)
For primary bibliographic entry see Field 1A.
AD-713 208

TAETIGKEITSBERICHTE 1969. FACHGEBIET 3: FESTIGKEIT, WERKSTOFFE, BAUWEISEN (Activity Report 1969. Division 3: Strength, Materials, Construction Methods),
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Porz-Wahn (West Germany)
For primary bibliographic entry see Field 22B.
AD-713 209

A STUDY OF THE DYNAMIC MOTIONS OF HINGELESS ROTORED HELICOPTERS.
Technical rept.,
Army Electronics Command Fort Monmouth N J
Norman K. Shupe. Aug 70, 268p Rept no. ECOM-3323

Descriptors: (*Helicopter rotors, Motion), (*Stabilization systems, Helicopters), Equations of motion, Bending, Rotor blades (Rotary wings), Angle of attack, Gyro stabilizers, Mathematical models.
Identifiers: Hingeless helicopter rotors.

The hingeless rotor is modeled as a system of thin cantilevered members, infinitely stiff in torsional and chordwise bending, executing pure elastic flapwise bending. It is shown that to model the rotor from hover thru high speed flight, the motions of a blade must be represented by its first two natural modes of flapwise bending. For this blade model, it is also shown that the hub moment developed is linearly related to the tip path plane tilt in hover but that the relationship becomes markedly nonlinear with increasing forward speed. Consideration is also given to the effects of a non-uniformly distributed induced velocity field. Th characteristics of the Lockheed gyro stabilization system are compared to those of the Bell gyro system and a conventional electronic stabilization system utilizing body mounted sensors. (Author)
AD-713 402 HC$3.00 MF$0.65

SOVIET CIVIL AIR TRANSPORT: AN APPRAISAL,
Army Command and General Staff Coll Fort Leavenworth Kans
For primary bibliographic entry see Field 1B.
AD-713 415 HC$3.00 MF$0.65

EXTERNAL LOADS AND THE STRENGTH OF FLIGHT VEHICLES (SELECTED CHAPTERS),
Foreign Technology Div Wright-Patterson AFB Ohio
A. I. Gudkov, and P. S. Leshakov. 3 Sep 70, 59p
Rept no. FTD-MT-24-64-70
Edited machine trans. of mono. Vneshnie Nagruzki i Prochnost Letatelnykh Apparatov, Moscow, 1968 p205-269, 445-470, by Robert A. Potts.

Descriptors: (*Aircraft, Loading (Mechanics)), Aircraft landings, Take-off, USSR.
Identifiers: Translations.

Contents: Loads during landing and ground movement; Action of dynamic loads on the construction; Application of computers for investigation of dynamic loading of constructions.
AD-713 461 HC$3.00 MF$0.65

ANTICOLLISION LIGHTS FOR THE SUPERSONIC TRANSPORT (SST),
Federal Aviation Administration Washington D C Office of Aviation Medicine
Siegfried J. Gerathewohl, Everett W. Morris, and Joseph A. Sirkis. May 70, 26p* Rept no. FAA-AM-70-9

Descriptors: (*Flash lamps, *Supersonic planes), (*Jet transport planes, *Aviation safety), Commercial planes, Night flight, Intensity, Colors, Visibility.
Identifiers: *Supersonic transports, *Anticollision lights.

For visual detection at night, the aircraft must display conspicuous light signals to indicate its presence and course at sufficient distance and time remaining for the pilot to avoid a collision. Considerations about the usefulness of anticollision lights must include such factors as effective light intensity, color, flashing characteristics, field of coverage, and visual detection range as well as flying speed, airplane response, and the pilot's capability to avoid a collision. Results of simulator experiments indicate that the pilot can take evasive actions at relatively high closing speeds under daylight conditions, but no data are available about collision avoidance at night. (Author)
AD-713 488 HC$3.00 MF$0.65

THE INTERNAL AND EXTERNAL FLOW FIELD ASSOCIATED WITH PARACHUTES DURING INFLATION,
Army Natick Labs Mass
Gregory C. De Santis. 1970, 15p

Descriptors: (*Parachutes, *Flow fields), Anemometers, Model tests, Wind tunnel models, Aerodynamic characteristics.
Identifiers: *Inflating, C-9 parachute canopies.

A hot-wire anemometer was used to obtain data on the flow field associated with an inflating parachute. Seven models simulating various stages of inflation of the C-9 parachute were fabricated and tested in a specially constructed test section where the temperature could be held uniform. Using this method, it was possible to accurately measure the internal and external flow surrounding the canopy. Some possible applications of the data to full-scale parachute systems are presented. (Author)
AD-713 520 HC$3.00 MF$0.65

THE DEVELOPMENT OF A KALMAN FILTERING ALGORITHM FOR HYBRID NAVIGATION IN ARMY AIRCRAFT,
Army Electronics Command Fort Monmouth N J
For primary bibliographic entry see Field 17G.
AD-713 553 HC$3.00 MF$0.65

BIBLIOGRAPHY OF DOCUMENTS CONTAINING NUMERICAL DATA ON PLANAR LIFTING SURFACES
Advisory Group for Aerospace Research and Development Paris (France)
R. Dat. Aug 70, 53p* Rept no. AGARD-R-574-70
NATO furnished.

Descriptors: (*Airfoils, *Bibliographies), Aerodynamic control surfaces, Wings, Lift, Statistical data, Aerodynamic characteristics.
Identifiers: *Lifting surfaces.

The bibliography covers the period 1951-1968, but in some cases only very brief information is given on the contents of works published before 1959. (Author)
AD-713 710 HC$3.00 MF$0.65

FORMAT--FORTRAN MATRIX ABSTRACTION TECHNIQUE. VOLUME V-SUPPLEMENT I. ENGINEERING USER AND TECHNICAL REPORT--EXTENDED.
Douglas Aircraft Co Long Beach Calif
For primary bibliographic entry see Field 20K.
AD-713 727 HC$3.00 MF$0.65

FLYING WEIGHT OF AN AIRCRAFT GENERATOR (Polethyi yes Samoletnogo Generatora),
Army Foreign Science and Technology Center Washington D C
For primary bibliographic entry see Field 10B.
AD-713 762 HC$3.00 MF$0.65

SEVERAL QUESTIONS IN THE SELECTION OF STRUCTURE OF FLIGHT CONTROL COMPUTERS,
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 9B.
AD-713 786 HC$3.00 MF$0.65

FORMAT-FORTRAN MATRIX ABSTRACTION TECHNIQUE. VOLUME VII--SUPPLEMENT I. DESCRIPTION OF DIGITAL COMPUTER PROGRAM--PHASE III--EXTENDED.
Douglas Aircraft Co Long Beach Calif
For primary bibliographic entry see Field 20K.
AD-713 840 HC$3.00 MF$0.65

MANUAL ON FATIGUE OF STRUCTURES. VOLUME 1 - FUNDAMENTAL AND PHYSICAL ASPECTS.
Advisory Group for Aerospace Research and Development, Paris (France).
W. G. Barrois. Jun 70, 295p AGARD-MAN-8-70-VOL-1

Descriptors: *Aircraft design, *Bibliographies, *Crack propagation, *Fatigue (materials), *Plastic deformation, *Static tests, Atomic structure, Creep properties, Metals, Notch strength, Stress concentration, Structural stability.

For abstract, see STAR 08 21.
N70-37802 HC$3.00 MF$0.65

FLIGHT INVESTIGATION OF THE ROLL REQUIREMENTS FOR TRANSPORT AIRPLANES IN CRUISING FLIGHT.
National Aeronautics and Space Administration. Flight Research Center, Edwards, Calif.
E. C. Holleman. Sep 70, 107p NASA-TN-D-5957, H-616
Contract 126-62-01-04-24

Descriptors: *Cruising flight, *Lateral control, *Roll, *Transport aircraft, Control simulation, Flight simulators, Mathematical models, Pilot performance.

For abstract, see STAR 08 21.
N70-38625 HC$3.00 MF$0.65

1D. Aircraft Flight Control and Instrumentation

WHAT MOVES, THE AIRPLANE OR THE WORLD. A REVIEW OF THE MOTION RELATIONSHIP PROBLEM IN PRESENTING AIRCRAFT ATTITUDE AND GUIDANCE INFORMATION.
Technical rept.,
Illinois Univ Savoy Aviation Research Lab

Steven L. Johnson, and Stanley N. Roscoe. Jun 70, 50p* Rept no. TR-ONR-70-1
Contract N00014-67-A-0305-0014

Descriptors: (*Flight instruments, Human engineering), (*Display systems, Flight instruments), Motion, Perception (Psychology), Pilots, Attitude indicators, Guidance, Reviews, Steering.

Display motion relationships for attitude and steering indicators have always been controversial issues in flight display design. The questions involve whether the pilot thinks the aircraft is moving relative to the outside world or the outside world is moving relative to the airplane. The pertinent information, obtained through both experience and formal experimentation, is reviewed. An alternative to the standard forms of attitude presentation employs the frequency separation principle. The problems considered when doing experimental investigations on flight displays are subject pools, research environments, flight tasks, and performance measures. Research requirements necessary to solve the longstanding questions on display motion relationships are presented. (Author)
AD-713 179 HC$3.00 MF$0.65

MASS FLOW, VELOCITY AND IN-FLIGHT THRUST MEASUREMENTS BY ION DEFLECTION,
Army Aeronautical Research Lab Moffett Field Calif
C. Rande Vause, and Robert S. Rudland. 1970, 15p

Descriptors: (*Airspeed indicators, *Vertical takeoff planes), Velocity, Thrust, Measurement, Ions.
Identifiers: VAMS (Vector Airspeed Measuring Systems), Vector airspeed measuring systems.

An investigation was made of the use of gaseous (ion) discharge sensors to achieve adequate measure of aircraft velocity and installed thrust. (Author)
AD-713 587 HC$3.00 MF$0.65

1E. Air Facilities

FROST INVESTIGATION 1944-1945. REPORTS ON SIOUX FALLS AIRFIELD, SIOUX FALLS, SOUTH DAKOTA, FAIRMONT AIRFIELD, FAIRMONT, NEBRASKA, GREAT BEND AIRFIELD, GREAT BEND, KANSAS, GARDEN CITY AIRFIELD, GARDEN CITY, KANSAS, AND PRATT AIRFIELD, PRATT, KANSAS.
Technical rept.
Arctic Construction and Frost Effects Lab Boston Mass

Jul 45, 156p Rept no. ACFEL-TR-1
Prepared in cooperation with Corps of Engineers, Omaha, Neb. Missouri River Div. See also AD-712 489.

Descriptors: (*Landing fields, Freezing), (*Pavements, Ice), Foundations (Structures), Frost heave, Periodic variations, Soils, Soil mechanics, Water, Trafficability, South Dakota, Nebraska, Kansas.
Identifiers: *Frost penetration, Fairmont Airfield, Garden City Airfield, Great Bend Airfield, Pratt Airfield, Sioux Falls Airfield.

The purpose of this investigation was the determination of the development of frost action in subsurface pavement elements as affected by varying conditions of weather, soils, and ground water. The investigation was made to determine the development of frost action in areas having varying winter weather conditions, varying annual precipitation and water tables, together with subsurface soils having an indicated varying susceptibility to frost action under the proper moisture conditions. The scope of this report covers investigations under both flexible and rigid type pavements.
AD-713 280 HC$3.00 MF$0.65

TABLES OF RUNWAY VISUAL RANGE VALUES AS A FUNCTION OF TRANSMITTANCE AND VARIOUS VALUES OF PILOT'S ILLUMINANCE THRESHOLD AND LIGHT TARGETS.
Final rept.,
Federal Aviation Administration Washington D C Systems Research and Development Service
Alcott J. Larsson, John K. Marut, and Robert L. Northedge. Aug 70, 62p* Rept no. FAA-RD-70-58

Descriptors: (*Runways, *Visibility), Pilots, Visual perception, Atmosphere, Light transmission, Illumination, Tables, Statistical data, Computer programs.
Identifiers: RVR (Runway Visual Range), Runway visual range.

Values of Runway Visual Range (RVR) were developed for various atmospheric transmittances utilizing Allard's Law and Koschmieder's Law. Commonly employed constant's of pilot's contrast threshold and visual illuminance threshold are utilized in the appropriate RVR equations. Computations are based on a 250 foot baseline transmissometer with light target intensities of 10,000, 2,000 and 400 candela, values which are presently used in the United States. Information is presented in tabular form showing transmittances corresponding to runway visual range readings from 600 feet to 7000 feet in 50 foot increments. Each table includes data for each of the three light target intensities. A total of eight tables is provided. The computer program which was utilized to develop each set of data is included with each table. (Author)
AD-713 495 HC$3.00 MF$0.65

RAPID ASSESSMENT OF AIRCRAFT LANDING SITES,
Army Engineer Waterways Experiment Station Vicksburg Miss
Richard G. Ahlvin, and George M. Hammitt, II. 1970, 14p

Descriptors: (*Landing fields, Site selection), Strength, Soil mechanics, Vehicles, Trafficability.

The procedure described in the paper permits rapid survey of entire landing sites by use of any available standard ground vehicle. Specifically, the process is one of selecting a standard vehicle, such as a 2-1/2-ton cargo truck, traversing a potential landing area, and noting the rutting. From the degree of rutting, a direct projection of allowable operations of any aircraft can be readily determined. (Author)
AD-713 502 HC$3.00 MF$0.65

COST EFFECTIVENESS STUDY - BARE BASE SURFACING REQUIREMENTS.
Technical rept.,
Air Force Aero Propulsion Lab., Wright-Patterson AFB, Ohio.
Mac A. Sheets. Sep 69, 129p AFAPL-TR-69-58
Distribution Limitation now Removed.

Descriptors: (*Landing fields, Construction materials), (*Cost effectiveness, Landing fields), Management planning, Metals, Membranes, Polyester plastics, Glass textiles, Soil mechanics, Transport planes, Jet fighters, Surface area, Pavements, Runways.
Identifiers: Evaluation, Bare base surfacing, Temporary airfields, Metal matting, C-130 aircraft, F-4 aircraft, F-4C aircraft.
AD-864 141 HC$3.00 MF$0.65

AIRFIELD PAVEMENT CONDITION SURVEY, USMCALF CAMP PENDLETON, CALIFORNIA.
Technical note,
Naval Civil Engineering Lab., Port Hueneme, Calif.
D. J. Lambiotte. Apr 70, 43p NCEL-TN-1088
Distribution Limitation now Removed.

Descriptors: (*Landing fields, Pavements), (*Pavements, Defects (Materials)), Statistical analysis, Concrete, Bituminous coatings, Air traffic, Runways, Skidding, Loading (Mechanics).
Identifiers: Evaluation, Portland cements, Camp Pendleton Marine Corps Landing Field.

The results of a survey as regards the condition of the airfield pavements at the U. S. Marine Corps Auxiliary Landing Field, Camp Pendleton, California is presented. The survey established statistically-based condition numbers (weighted defect densities) which were direct indicators of the condition of the individual asphaltic concrete and portland cement concrete pavement facilities. Additional evaluation efforts included photographic coverage of defect types, preparation of the construction history of the station, compilation of data on current aircraft traffic and aircraft types using the station, and performance of runway skid resistance test. (Author)
AD-871 580 HC$3.00 MF$0.65

CLIMATOLOGY OF THE TONTOUTA AIRFIELD.
France. Direction de La Meteorologie Nationale, Paris.
For primary bibliographic entry see Field 4B.
For abstract, see STAR 08 21.
N70-38299 HC$3.00 MF$0.65

STATE OF OKLAHOMA AIRPORT PLAN.
Oklahoma Univ. Research Inst., Norman.

May 70, 150p
Prepared in cooperation with Oklahoma Industrial Development and Park Planning, Oklahoma City. Div. of Research and Planning. Sponsored in part by Oklahoma Aeronautics Commission.

Descriptors: (*Airports, *Oklahoma), (*Regional planning, Airports), Expenses, Classifications, Populations.

The intent of the study was to develop a systematic plan for airport development over the time period to 1980. To accomplish this task, the project was separated into five work elements: (1) Verification and classification of airports; (2) Determinants of airport facilities; (3) Aviation development model; (4) Test of the model; (5) Schedule of projected investments for Oklahoma airports. (Author)
PB-194 937 HC$3.00 MF$0.65

2. AGRICULTURE

2C. Agricultural Engineering

DETERMINATION OF THE MOUNTING ANGLE OF ROTARY TILLER TOOLS,
National Tillage Machinery Lab., Auburn, Ala.
A. D. Lukyanov. 25 May 70, 9p
Trans. of Traktory i Selkhozmashiny (USSR) n9 p20-22 1969, by William R. Gill.

Descriptors: (*Agricultural machinery, Design), Kinematics, Cultivation, Translations, USSR.
Identifiers: *Rotary tillers, Soil machine relations.

The parameters of rotary tillers are examined from the standpoint of determining the angle of mounting of the rotating tools. An expression was developed to describe the optimum tool angle through a knowledge of the depth of tilling, blade radius, and a coefficient C which described the relation between the circle and the trochoid of the path of the tool. (NTML abstract)
PB-194 839T HC$3.00 MF$0.65

THE INFLUENCE OF PHYSICAL-MECHANICAL PROPERTIES OF SOIL ON THE WEAR OF CULTIVATOR POINTS,
National Tillage Machinery Lab., Auburn, Ala.

D. Kim, Z. B. Goldin, and V. I. Khutornoi. 6 May 70, 3p
Trans. of Mekhanizatsiya i Elektrifikatsiya Sotsialisticheskogo Selskogo Khozyaistva (USSR) v28 n1 p40-41 1970, by William R. Gill.

Descriptors: (*Agricultural machinery, Wear), (*Drills, Wear resistance), Soil mechanics, Abrasion, Translations, Hardness, USSR.
Identifiers: Coulters, Soil machine relations.

The wear of opening coulters of a drill was examined after different periods of operation. The wear was measured by means of a micrometer along the edge of the working tool. Wear increased sharply in proportion to increases of hardness. At a hardness of 8.9 kg/sq cm it was 0.029 mm/ha and for 11.9-17.9 kg/sq cm it was 0.078 mm/ha. (NTML abstract)
PB-194 840T HC$3.00 MF$0.65

STUDY OF TRACTION OF PNEUMATIC TIRES WITH COMPACTIBLE SOIL,
National Tillage Machinery Lab., Auburn, Ala.
N. F. Kosharn. 8 Apr 70, 11p
Trans. of Mekhanizatsiya i Elektrifikatsiya Selskogo Khozyaistva; Respublikanskii Mezhvedomstvennyi Tematicheskii. Nauchnyi Sbornik (USSR) n5 p128-134 1966, by William R. Gill.

Descriptors: (*Agricultural machinery, Tires), (*Tires, Traction), Soils, Cultivation, Shear strength, Interactions, Compactibility, USSR, Translations.

Studies of an analytical relationship and experimental data about the resistance to shear of soil on rubber at different moisture contents permits prediction of the influence of vertical load, inflation pressure and soil-climatic conditions on the coefficient of traction. The agreement is sufficiently close so that the method may be used for evaluation of tractive properties of wheeled transport and agricultural machines operating on compactible soils. (Author)
PB-194 841T HC$3.00 MF$0.65

RELATIONSHIP OF MECHANICAL CHARACTERISTICS OF SOIL TO ITS HARDNESS AND SPEED OF DEFORMATION WITH A ROLLING WHEEL,
National Tillage Machinery Lab., Auburn, Ala.
For primary bibliographic entry see Field 8M.
PB-194 842T HC$3.00 MF$0.65

THE ROLLING FRICTION OF WHEELS ON COMPACTED SOIL,
National Tillage Machinery Lab., Auburn, Ala.
D. I. Zolotarovskaya. 27 May 70, 9p
Trans. of Moskovskaya Selskokhozyaistvennaya Akademiya. Doklady (USSR) n136 p153-160 1968, by William R. Gill.

Descriptors: (*Agricultural machinery, Vehicle wheels), (*Soils, Trafficability), (*Vehicle wheels, Friction), Viscoelasticity, Loads (Forces), Deformation, Applications of mathematics, Translations, USSR.
Identifiers: Soil machine relations.

An equation was used to describe the properties of soil under loading by a rigid wheel. The force on towed and driven wheels can be calculated using the equation if te speed of rolling and the viscoelastic properties of the soil are known. Increases in speed of the wheel caused a decrease of the rolling resistance and depth of rut. (NTML abstract)
PB-194 844T HC$3.00 MF$0.65

THE INFLUENCE OF THE SHAPE OF CUTTING EDGE OF KNIVES ON THE RESISTANCE TO UNDERCUTTING OF THE SLICE DURING TILLAGE OF SOIL,
National Tillage Machinery Lab., Auburn, Ala.
P. S. Korotkevich. 6 Apr 70, 8p
Trans. of Mekhanizatsiya i Elektrifikatsiya Selskogo Khozyaistva; Respublikanskii Mezhvedomstvennyi Tematicheskii. Nauchnyi Sbornik (USSR) n8 p13-17, by William R. Gill.

Descriptors: (*Agricultural machinery, Design), (*Plows, Cutting), (*Cultivation, Agricultural machinery), Soil properties, Knives, Sands, Clay soils, Force, Pressure, Translations, USSR.
Identifiers: Soil tool relations, Soil cutting.

The pressure on the cutting edge of the knife depends on the physico-mechanical properties of the soil. During undercutting of a slice in clay soil the pressure on the edge of the knife is 8-12% higher than at the center part. In sandy soil knives with straight edges had lower draft requirements than concave and convex shapes. In a clay soil there was an optimum curvature 1/R = .067 at which a minimum draft force existed. (NTML Abstract)
PB-194 845T HC$3.00 MF$0.65

FRICTION AND EFFICIENCY OF POWERED WHEELS,
National Tillage Machinery Lab., Auburn, Ala.
N. D. Luchinskii. 26 May 70, 5p
Trans. of Mekhanizatsiya i Elektrifikatsiya Sotsialisticheskogo Selskogo Khozyaistva (USSR) v26 n9 p37-38 1968, by William R. Gill.

Descriptors: (*Agricultural machinery, Vehicle wheels), (*Vehicle wheels, Friction), Forces, Soils, Compactibility, Traction, Loads (Forces), USSR, Translations.

The forces on wheels are examined during a condition in which they are pulling a load across a compactible soil. The coefficient of traction can be determined from values of slip epsilon and the drawbar load. (NTML abstract)
PB-194 846T HC$3.00 MF$0.65

EXPERIMENTAL DETERMINATION OF THE BASIC PARAMETERS OF FLAT SWEEPS,
National Tillage Machinery Lab., Auburn, Ala.
P. A. Shcherbina, and N. S. Velichko. 15 May 70, 10p
Trans. of Nauchno-Issledovatelskii Institut Selskogo Khozyaistva Krainego Severa. Trudy (USSR) n2 p464-474 1966, by William R. Gill.

Descriptors: (*Agricultural machinery, Design), Cultivation, Force, Velocity, Translations, USSR.
Identifiers: *Sweeps (Agricultural machinery), Tillage.

A study was made of the change of draft resistance of experimental sweeps and the specific resistance in relation to different angle of crumbling, tip angle, width of cut of sweep, different depths of operation and speeds of movement. The best agro-technical performance occurred with an angle of crumbling of 20-25 degrees and tip angles of 76-110 degrees. Increases of width of cut of sweeps caused a linear increase of draft resistance but a reduction of specific resistance in different conditions of density and depth of operation. Increases in depth of operation caused increases of draft resistance and specific resistance. (NTML abstract)
PB-194 847T HC$3.00 MF$0.65

THE INFLUENCE OF LOW FREQUENCY VIBRATIONS OF A CUTTING TOOL ON THE CUTTING OF SOIL,
National Tillage Machinery Lab., Auburn, Ala.
S. B. Bondarenko, V. A. Cherkasov, and D. P. Volkov. 6 May 70, 6p
Trans. of Stroitelnye i Dorozhnye Mashiny (USSR) v15 n1 p18-19 1970, by William R. Gill.

Descriptors: (*Agricultural machinery, Vibration), (*Soils, Cutting), (*Earth handling equipment, Vibration), Force, Deformation, Interactions, Damping, Translations, USSR.
Identifiers: Soil machine relations.

The study of single bucket and rotary excavators, bulldozers, scrapers, confirm the significance of the interacting influence of vibrations and force of cutting. The most obvious way in which this is manifest is in the deformation vibration; for example, for rotary excavators, because of the dissipation of energy in metal construction and drive, the logarithmic decrement of vibration is lambda = 0.05-0.12. During operation of an ERG-1600 excavator, the magnitude of lambda due to the soil reaches 0.3. The correct calculation of the interaction of the vibration and the force of cutting during design of working tools of earth moving machines allows using soil as a damping media and overcoming the formation of an undesirable vibration influence. (NTML abstract)
PB-194 848T HC$3.00 MF$0.65

THE NECESSITY OF A SYSTEMATIC STUDY OF THE TECHNOLOGICAL PROPERTIES OF SOIL,
National Tillage Machinery Lab., Auburn, Ala.
For primary bibliographic entry see Field 8M.
PB-194 849T HC$3.00 MF$0.65

THE DYNAMIC THEORY OF A WEDGE OPERATING IN A SOIL MEDIA,
National Tillage Machinery Lab., Auburn, Ala.
K. G. Arutyunyan. 9 Apr 70, 12p
Trans. of Institut Inzhenerov Selskokhozyaistvennogo Proizvodstva. Doklady (USSR) v3 n1 p21-31 1966, by William R. Gill.

Descriptors: (*Agricultural machinery, Design), (*Plows, Operation), Deformation, Stresses, Compressive properties, Separation, USSR, Cultivation, Soils, Translations.
Identifiers: Soil machine relations, Soil displacement.

The critical velocity of the soil is the velocity at which breakup occurs in the region of immediate contact of the tool with the soil. When the speed of movement of the tool is less than the critical velocity the problem is solved by static or dynamic methods. When it exceeds the critical velocity it must be solved by dynamic theory of wave stress. An examination of the problem from the point of view of theory of wave stress, not only explains the mechanism of deforming soil clods in the process of their moving along the surface of the working tools of tillage machines but makes possible considering the influence of the kinematic parameters of vibration caused by the influence of resonance in detached clods of soil. (NTML abstract)
PB-194 850T HC$3.00 MF$0.65

INFLUENCE OF MOUNTING OF KNIVES AND SHANKS OF FLAT SWEEPS ON THE RESISTANCE OF SOIL DURING CULTIVATION,
National Tillage Machinery Lab., Auburn, Ala.
L. A. Grachev. 13 Apr 70, 24p
Trans. of Vestnik Mekhanizatsii Vaskhnil (sic) n5 p14-29 1940, by William R. Gill.

Descriptors: (*Agricultural machinery, Design), (*Plows, Resistance), Soils, Cultivation, Knives, Intensity, Force, USSR, Translations.
Identifiers: Soil machine relations.

Dynamometer measurements were made of the forces on cultivator sweeps using different mounting systems. Decreases of tip angle from 60 degrees to 25 degrees increased the draft of the tool in a linear relation, the magnitude being larger the more compact the soil. A minimum of the draft force occurs with a tip angle of 90 degrees. Wear of the cutting edge is more intensive at small tip angles. (NTML abstract)
PB-194 851T HC$3.00 MF$0.65

THE DETERMINATION OF KINEMATIC AND CONSTRUCTION PARAMETERS OF SOIL ROTARY TILLERS,
National Tillage Machinery Lab., Auburn, Ala.

F. M. Kanarev, V. B. Dontsov, and V. V. Borozdin. 1Jul 70, 12p
Trans. of Kubanskii Selskokhozyaistvennyi Institut, Krasnodar. Trudy (USSR) n14 p183-188 1967.

Descriptors: (*Agricultural machinery, Design), Cultivation, Soils, Cutting, Kinematics, Blades, Loads (Forces), Translations, USSR.
Identifiers: *Rotary tillage.

An analysis is made of the parameters of soil rotary tillers operating in the forward and reverse rotations. The cutting angle of the blade and its variation through the cutting angle determines the expenditure of energy for cutting soil. The magnitude of the size of cut S is related to the quality of work and load fluctuations on the rotary tiller. Selection of a value of S permits selection of the mounting angle of the blades and the radius of the rotary tiller drum. (Author)
PB-194 992T HC$3.00 MF$0.65

THE BALANCE OF POWER OF ROTARY EQUIPMENT,
National Tillage Machinery Lab., Auburn, Ala.
Ya. B. Elgurt. 6 Apr 70, 8p
Trans. of Institut Inzhenerov Selskokhozyaistvennogo Proizvodstva. Doklady (USSR) v3 n1 p33-39 1966.

Descriptors: (*Agricultural machinery, Mechanical efficiency), Power, Soils, Cultivation, Velocity, Translations, USSR.

An equation expressing the power required for rotary tilling soil is analyzed in terms of the power requirements for pushing the tiller, throwing soil, efficiency of the transmission, loosening the soil and moving the machine along the field. Specific terms are suggested for the expression of each of the elements of the equation. (Author)
PB-194 993T HC$3.00 MF$0.65

SOME RESULTS OF FIELD TESTS OF ROTARY HARROWS WITH ACTIVE WORKING TOOLS,
National Tillage Machinery Lab., Auburn, Ala.
D. D. Prokopenko, and Ya. B. Elgurt. 5 Jun 70, 11p
Trans. of Institut Inzhenerov Selskokhozyaistvennogo Proizvodstva. Doklady (USSR) v1 n1 p47-58 1964.

Descriptors: (*Agricultural machinery, Performance), Soils, Cutting tools, Deformation, Velocity, Cultivation, Translations, USSR.
Identifiers: *Rotary harrows.

The influence of forward and circumferential velocities, directions of rotation, angle of tool entry into the soil and spacing of tools was determined in field conditions. The greatest soil breakup occurred at a forward velocity of 5.7 m/sec and a circumferential velocity of 4.1 m/sec. The quality of harrowing by a rotary harrow is significantly better than two harrowings of a spike tooth harrow. (Author)
PB-194 994T HC$3.00 MF$0.65

STUDY OF THE ROLLING RESISTANCE OF LOW PRESSURE TIRES ON SOIL,
National Tillage Machinery Lab., Auburn, Ala.
N. F. Kosharn. 9 Apr 70, 10p
Trans. of Mekhanizatsiya i Elektrifikatsiya Selskogo Khozyaistva; Respublikanskii Mezhvedomstvennyi Tematicheskii. Nauchnyi Sbornik (USSR) n5 p135-141 1966.

Descriptors: (*Vehicle wheels, Trafficability), (*Agricultural machinery, Tires), Soils, Pressure, Deformation, Elasticity, Compacting, Translations, USSR.
Identifiers: *Soil machine relations.

Forces were examined for an elastic wheel being towed on a compactible soil. The radial deformation of the tire causes a large influence on the rolling resistance. On weak soils a decrease of inflation pressure always leads to a decrease in the rolling resistance. On more compact soils there is an optimum amount of radial deformation. The mechanical properties of soil have the greatest influence on the coefficient of rolling resistance. (Author)
PB-194 995T HC$3.00 MF$0.65

STUDIES OF ROTARY TILLING SOIL,
National Tillage Machinery Lab., Auburn, Ala.
Ya. E. Zhuk. 18 Jun 70, 24p
Trans. of Mekhanizatsiya i Elektrifikatsiya Sotsialisticheskogo Selskogo Khozyaistva (USSR) n15 p18-39 1952, by William R. Gill.

Descriptors: (*Agricultural machinery, Cultivation), Deformation, Soils, Knives, Blades, Design, Translations, USSR.

The energy requirements of rotary tillers are examined for the purpose of determining the percent of the power expended for tilling, pushing and deformation. Measurements of power were made while varying the number of knives, thickness of chip, velocity of knives, forward velocity and type of blades. Increasing the thickness of the chip which is being cut increases the power expended in pushing, separating the chip, and deformation. The work expended per unit volume of chip decreases with an increase in size of chip. (Author)
PB-194 996T HC$3.00 MF$0.65

THE BASIS OF THE CRUMBLING ANGLE OF CULTIVATOR SWEEPS DESIGNED FOR OPERATION AT HIGH SPEEDS,
National Tillage Machinery Lab., Auburn, Ala.
V. S. Revuka. 25 Mar 70, 10p
Trans. of Mekhanizatsiya i Elektrifikatsiya Selskogo Khozyaistva; Respublikanskii Mezhvedomstvennyi Tematicheskii. Nauchnyi Sbornik (USSR) n8 p29-35 1967.

Descriptors: (*Agricultural machinery, Design), (*Soils, Displacement), Cultivation, Particles, Velocity, Motion, Applications of mathematics, Translations, USSR.
Identifiers: *Soil machine relations.

Equations are developed for describing the movement of soil particles along the sides of cultivator sweeps. Measurement of the displacement of marked particles in the soil provided a means of ascertaining the movement of soil particles in a dynamic situation. Increases in the velocity of the tool and the crumbling angle Beta caused increases in the distance of movement of soil particles. The greatest amount of movement of soil particles is in the direction of movement of the tool. (Author)
PB-194 997T HC$3.00 MF$0.65

CLEARING OF AGRICULTURAL LANDS OF ROCKS,
National Tillage Machinery Lab., Auburn, Ala.
M. E. Matsepuro, and G. E. Sukhorukov. 16 Jul 70, 49p
Trans. of Voprosy Selskokhozyaistvennoi Mekhaniki (USSR) v4 Chap3 p97-145 1960.

Descriptors: (*Agricultural machinery, Design), (*Rocks, Removal), Soils, Drag, Force, Separators, Hauling, Land reclamation, Translations, USSR.
Identifiers: *Stone pickers, Land clearing, Stony soils, Soil machine relations.

The mechanics of removing rocks from soil depends on physical-mechanical properties of rocks and the soil. The force required to uproot rocks varies in relation to depth of burial. The design of the uprooter must incorporate means of controlling the direction of movement of teeth to operate with the minimum forces. The high coefficient of drag of sleds on soil shows the importance of designing wheeled or tracked transport vehicles to haul rocks from areas to be cleared. (NTML abstract)
PB-194 998T HC$3.00 MF$0.65

BASIC INTERACTION OF AN INCLINED FLAT WEDGE WITH SOIL,
National Tillage Machinery Lab., Auburn, Ala.
A. T. Vagin. 24 Jun 70, 34p
Trans. of Voprosy Selskokhozyaistvennoi Mekhaniki (USSR) v15 Chap1 p66-89 1965.

Descriptors: (*Agricultural machinery, Design), (*Soils, Interactions), (*Cultivation, Agricultural machinery), Force, Peat, Lift, Excavation, Translations, USSR.
Identifiers: Soil machine relations, Soil displacement, Ditchers.

A linear relation between the lift height of a tool and the specific resistance of the tool has been determined for virgin peat soils. The equation has two parameters, K and N, which reflect soil properties. The equation permits determination of the energy requirements of a passive working tool. The data show the desirability of reducing the lift height of a tool as a means of minimizing the energy requirements of the tool. (NTML abstract)
PB-194 999T HC$3.00 MF$0.65

STONE PICKING MACHINES,
National Tillage Machinery Lab., Auburn, Ala.
K. I. Preobrazhenskii, and V. Sh. Liflyandskii. 22 May 70, 8p
Trans. of Gidrotekhnika i Melioratsiya (USSR) v20 n5 p85-91 1968, by William R. Gill.

Descriptors: (*Agricultural machinery, Performance), (*Rocks, Removal), Sieves, Separation, Soils, Land reclamation, Translations, USSR.
Identifiers: *Stone picking machines, Land clearing, Soil machine relations, Stony soils.

Stone picking machines are compared on the basis of their capabilities. Machines are classified as having a cyclic action which removes stones or a direct action which continuously loosens and sieves a layer of soil. The direct acting pickers have better performance than cyclic acting machines. Characteristics of modern stone pickers are provided. (Author)
PB-195 002T HC$3.00 MF$0.65

THE INFLUENCE OF THE SPRING SUSPENSIONS OF CULTIVATOR SWEEPS ON THE QUALITY AND ENERGY INDICES OF THEIR PERFORMANCE,
National Tillage Machinery Lab., Auburn, Ala.
G. A. Ryabtsev. 1 Apr 70, 10p
Trans. of Mekhanizatsiya i Elektrifikatsiya Selskogo Khozyaistva; Respublikanskii Mezhvedomstvennyi Tematicheskii. Nauchnyi Sbornik (USSR) n8 p45-50 1967, by William R. Gill.

Descriptors: (*Agricultural machinery, Performance), Cultivation, Springs (Elastic), Vibration, Soils, Adhesion, Force, Translations, USSR.
Identifiers: *Cultivators, Sweeps (Agricultural machinery), Tillage, Soil adhesion.

The influence of spring suspension on performance of cultivator sweeps is studied. The induced vibrations reduce the amount of soil adhering to the sweeps and the number of weeds which envelop the shanks of the tools. The spring suspensions provide draft reductions to speeds of 8-10 km/hr without a reduction in the quality of tillage when depths of operation do not exceed 10 cm. (NTML abstract)
PB-195 003T HC$3.00 MF$0.65

2D. Agronomy and Horticulture

EFFECT OF HIGH LEVELS OF NITROGEN ON MINERAL CONTENT AND DISORDER INCIDENCE IN JONATHAN APPLES IN POT CULTURE,
Commonwealth Scientific and Industrial Research Organization, Canberra (Australia). Div. of Plant Industry.
D. Martin, T. L. Lewis, J. Cerny, and A. Grassia.
28 Apr 70, 17p Technical paper-29

Descriptors: (*Apple trees, *Plant growth), (*Nitrogen inorganic compounds, Plant growth), (*Fertilizers, Apple trees), Analysis of variance, Calcium compounds, Nitrates, Sulfates, Defects, Storage, Ammonium sulfate, Correlation techniques, Australia.
Identifiers: Jonathan apples, Bitter pit.

Fruiting Jonathan trees were grown in pot culture for one year at low nutrient levels, and for a second year at standard nutrient levels with or without high nitrogen as urea, ammonium nitrate, or ammonium sulphate. Analysis of single fruits showed that there were variations in major element levels between fruits on the same tree similar to variations in the field. The more distal fruits were lower in calcium and magnesium and higher in nitrogen and phosphorus than the more basal fruits. All high-nitrogen treatments increased nitrogen and phosphorus content of the fruit. Ammonium sulphate reduced calcium, magnesium, and potassium. Ammonium nitrate did this also but to a lesser extent. Urea did not reduce calcium or potassium. Similar responses occurred in leaves where urea increased magnesium significantly. The parallels in bark and wood were less close. Differences between organs in response to the different forms of nitrogen occurred. Ammonium sulphate and ammonium nitrate treatments increased incidence of bitter pit while urea did not. This pattern of association was reversed for breakdown. The depression of calium content by ammonium sulphate and ammonium nitrate and a possible increase in magnesium content by urea are suggested as a cause. Partial regression and correlation analyses of variables were carried out. (Author)
PB-194 966 HC$3.00 MF$0.65

2E. Animal Husbandry

COMPARATIVE PATHOLOGY OF OVARIAN NEOPLASMS. IV. GONADAL STROMAL TUMOURS OF CANINE SPECIES,
Armed Forces Inst of Pathology Washington D C
For primary bibliographic entry see Field 6E.
AD-713 352

INVESTIGATION OF A NEW DISEASE OF MILITARY DOGS,
Walter Reed Army Inst of Research Washington D C
Robert M. Nims, David L. Huxsoll, Paul K. Hildebrandt, and Jerry S. Walker. 1970, 11p

Descriptors: (*Dogs, *Diseases), (*Veterinary medicine, Dogs), (*Rickettsiaceae, Diseases), Hemorrhage, Anemias, Leukocytes, Hematology, Fevers, Pathology, Histology, Infections, Chemotherapy, Tetracyclines, Blood diseases, Etiology, Infectious diseases, Disease vectors, Ticks, Military medicine, Southeast Asia.
Identifiers: *Tropical canine pancytopenia, *Ehrlichia canis.

In July 1968, an epizootic of a fatal hemorrhagic disease, characterized by unilateral or bilateral epistaxis, began in U. S. military dogs in Southeast Asia. The disease appeared to be the same as Tropical Canine Pancytopenia (TCP) described by the British in military dogs in Singapore as early as 1963, and was similar to a disease reported by the French in military dogs in Tunisia. A coordinated investigation of the disease was initiated with the objective of determining the cause and nature of the disease and means of control. The results from these investigations are summarized in this report.
AD-713 566 HC$3.00 MF$0.65

2F. Forestry

FOREST RESOURCES OF THE SUSITNA VALLEY, ALASKA.
Forest Service resource bulletin (final) 1964-65,
Pacific Northwest Forest and Range Experiment Station, Portland, Oreg.
Karl M. Hegg. 1970, 48p FSRP-PNW-32, PNW-Misc-70131
Paper copy available from Pacific Northwest Forest and Range Experiment Station, P.O. Box 3141. Portland, Oreg. 97208. Free.

Descriptors: (*Forest trees, Statistical analysis), (*Natural resources, *Alaska), Classification, Production, Volume, Wood products, Soils, Climatology, Maps.
Identifiers: Susitna Valley, *Forest resources, Timber production.

Findings of the first intensive inventory of the forest resources of the Susitna Valley are given. The commercial forest area of 1.3 million acres contains over 1.4 billion cubic feet of timber. Most of these forests are overmature and have large nonproductive areas within them reducing both volume and potential growth. Discussion covers present use and future timber production as of January 1, 1965. (Author)
PB-194 986 MF$0.65

EROSION AND SEDIMENTATION FOLLOWING ROAD CONSTRUCTION AND TIMBER HARVEST ON UNSTABLE SOILS IN THREE SMALL WESTERN OREGON WATERSHEDS.
Forest Service Research paper (Final),
Pacific Northwest Forest and Range Experiment Station, Portland, Oreg.
R. L. Fredriksen. 1970, 19p FSRP-PNW-104
Paper copy available from Pacific Northwest Forest and Range Experiment Station, P. O. Box 3141, Portland Oreg. 97208. Free.

Descriptors: (*Forestry, Erosion), (*Streams, *Sedimentation), (*Roads, Erosion), Forest trees, Harvesting, Construction, Forest land, Soils, Landslides, Watersheds, Oregon.
Identifiers: Logging roads.

In two steep headwater drainages, landslides were the predominant source of increased sedimentation of streams following timber harvest. Patch-cut logging with forest roads increased sedimentation compared with a control by more than 100 times over a 9-year period. Landslide erosion was greatest where roads crossed high gradient stream channels. In an adjacent clearcut watershed with no roads, sedimentation increased three times that of the control. (Author)
PB-194 987 MF$0.65

WASHINGTON MILL SURVEY 1968: WOOD CONSUMPTION AND MILL CHARACTERISTICS.
Pacific Northwest Forest and Range Experiment Station, Portland, Oreg.
For primary bibliographic entry see Field 11L.
PB-195 032 MF$0.65

FURTHER DEVELOPMENT OF RADIOISOTOPE TECHNIQUES FOR MEASURING WATER MOVEMENT IN LARGE TREES,
Pacific Southwest Forest and Range Experiment Station, Berkeley, Calif.
Peyton W. Owston, James L. Smith, and Howard G. Halverson. 10 Mar 70, 38p
Contract AT (49-11)-2773

Descriptors: (*Trees (Plants), *Capillary flow), Water, Plant physiology, Transpiration, Isotopic labeling.

For abstract, see NSA 24 20.
TID-25463 HC$3.00 MF$0.65

3. ASTRONOMY AND ASTROPHYSICS

3A. Astronomy

OBSERVATIONS OF 1620 GEOGRAPHOS,
Naval Observatory Washington D C
Betty F. Mintz. 30 Mar 70, 2p Rept no. NOBS-Reprint-109
Availability: Pub. in Astronomical Jnl., v75 n5 p663-664 Jun 70.

Descriptors: (*Asteroids, Position finding), Gravity, Earth (Planet), Astronomical observatories, Photographic analysis, Stars, Space surveillance systems.
Identifiers: Geographos asteroid, Alinda asteroid.

During its recent close approach to the Earth, the minor planet 1620 Geographos was observed at the Cerro Tololo Inter-American Observatory with both the 60-inch Ritchey-Chretien reflector and the 24-inch Curtis Schmidt telescope. Seventy-four positions were obtained, spanning an arc length of approximately 100 deg. (Author)
AD-713 667

RELATIVE HEIGHTS OF PHOTOGRAPHIC FEATURES OF THE MOON.
Scientific rept. no. 2, 16 Jan 69-15 Mar 70,
Manchester Univ (England) Dept of Astronomy
Zdenek Kopal, and Michael Moutsoulas. Jun 70, 26p Rept no. 0002-2 AFCRL-70-0487
Contract F61052-68-C-0002

Descriptors: (*Moon, Extraterrestrial topography), (*Extraterrestrial topography, Height finding), Photographic analysis, Projective geometry, Stars, Mapping.
Identifiers: *Selenography.

The aim of the report is to give an account of the research developed between January 1969 and March 1970 in 9pursuit of the main objectives of work sponsored by the contract. An account of the estimated reduction errors is given and coordinates of lunar features referred to a system of axes parallel to the projection of the ecliptic coordinates on the photographic plate are presented for four plates. A selection of lunar reference points considered at most suitable for selenodetic work is presented. (Author)
AD-713 679 HC$3.00 MF$0.65

3B. Astrophysics

VARIATION IN OVII X-RAY LINE EMISSION FROM THE SOLAR CORONA.
Rept. for Feb-Jul 70,
Aerospace Corp El Segundo Calif Lab Operations
Hugo R. Rugge, and Arthur B. C. Walker, Jr. 15 Oct 70, 23p Rept no. TR-0059 (9260-02)-3 SAMSO-TR-70-358
Contract F04701-70-C-0059

Descriptors: (*Solar corona, Electron density), (*Solar spectrum, X rays), Line spectrum, Selection rules, Intensity.
Identifiers: Solar x rays, OV1 10 satellite, Emission spectra.

The variation in intensity of the solar x-ray resonance intercombination and forbidden lines of helium-like OVII with 2800 MHz solar radio flux is presented for three solar rotations. A high correlation (r approximately equal to 0.80) exists between the intensities of all three x-ray lines and the 2800 MHz solar flux. The ratio of the forbidden to the intercombination line intensities is found to be essentially independent of long term solar activity. This ratio is used to determine upper limits on the coronal electron density and to make inferences concerning the change in density with solar activity. (Author)
AD-713 112 HC$3.00 MF$0.65

BRIGHTNESS TEMPERATURES OF THE QUIET SUN AND NEW MOON AT THE 6-MM WAVELENGTH.
Rept. for May 69-Mar 70,
Aerospace Corp El Segundo Calif Lab Operations
E. E. Reber. 11 Sep 70, 34p Rept no. TR-0059 (6230-30)-6 SAMSO-TR-70-371
Contract F04701-70-C-0059

Descriptors: (*Solar radiation, Millimeter waves), (*Moon, Millimeter waves), Surface temperatures, Mapping, Radiometers, Brightness.

Absolute brightness temperatures and brightness temperature ratios of a quiet region near the center of the solar disk and the central region of the new moon were measured simultaneously at the 6-mm wavelength. The measured quiet sun/new moon brightness temperature ratios and reported central brightness temperatures of the new moon confirm the measured brightness temperature of the quiet sun at the 6-mm wavelength. Reported central brightness temperatures of the new moon are tabulated and graphed as a function of frequency and wavelength. The equation of a linear regression line for the reported measurements is given for estimating the brightness temperature of the new moon at any millimeter wavelength. Estimated brightness temperatures of the new moon and measured quiet sun/new moon ratios are used to estimate solar brightness temperatures at several millimeter wavelengths. The solar brightness temperatures, the regression line, and the Van de Hulst theoretical model are presented graphically as a function of frequency and wavelength. The regression line equation is given for estimating solar brightness temperatures at any wavelength in the 6- to 1-mm wavelength interval and is solved for the wavelength of the measured ratios. (Author).
AD-713 114 HC$3.00 MF$0.65

PARTICLE FLUX ASSOCIATED WITH STOCHASTIC PROCESSES,
Stanford Univ Calif Inst for Plasma Research
For primary bibliographic entry see Field 20I.
AD-713 124 HC$3.00 MF$0.65

ON THE THEORY OF POLARIZATION TRANSFER IN INHOMOGENEOUS MAGNETIZED PLASMAS,
Stanford Univ Calif Inst for Plasma Research
For primary bibliographic entry see Field 20I.
AD-713 151 HC$3.00 MF$0.65

REDSHIFT DISTRIBUTION OF QUASI-STELLAR OBJECTS AND THE RADIO SOURCE COUNTS,
Stanford Univ Calif Inst for Plasma Research
Vahe Petrosian. Sep 70, 14p Rept no. SU-IPR-392
Contract N00014-67-A-0112-0006
Presented at the IAU Symposium (44th) Uppsala, (Sweden) 10-14 Aug 70.

Descriptors: (*Extraterrestrial radio waves, Doppler effect), Relativity theory, Mathematical models, Radio astronomy.
Identifiers: *Quasars, Red shift.

The authors discuss the large scale redshift distribution of QSO's to determine their evolution and reality of the apparent cut-off in their distribution for redshift z greater than or equal to 2.3, in the relativistic cosmological model with zero cosmological constant and with deceleration parameter q sub zero = +1. The authors do not discuss the distribution in the Lemaitre models which were introduced in 1967 (Petrosian et. al.) and have been reviewed recently (Petrosian and Salpeter 1970). In a recent article (Petrosian 1970) the authors have shown that the density evolution derived by Schmidt (1968) from the data on 33 3CR quasi-stellar radio sources (QSR's) cannot continue beyond z approximately equal to 2.2. In the report the authors discuss possible evolutions of sources for z greater than 2.2, then based on these models the authors calculate the contribution of QSR's to the radio source counts. (Author)
AD-713 189 HC$3.00 MF$0.65

SOLAR RADIOASTRONOMY INSTRUMENTAL PROGRESSES AND RESEARCHES, 1969-1970.
Final scientific rept.,
Osservatorio Astronomico Trieste (Italy)
Alberto Abrami, and Giorgio Sedmak. 1 Apr 70, 29p AFCRL-70-0407
Contract AF 61 (052)-926

Descriptors: (*Solar radiation, *Extraterrestrial radio waves), (*Radio telescopes, Design), Solar disturbances, Polarization, Polariscopes, Chromosphere, Magnetic fields, Resolution, Radiometers, Italy.
Identifiers: *Solar radio emission.

Observations of the solar radio flux density were undertaken in March 1966 and pursued in the following years with the aim of studying the radio outbursts correlated with chromospheric flares. A ten-meter parabolic reflector has been planned and constructed for the observations of flux density and polarization in ten frequency bands between 200 and 1000 Mc/sec. The work done until Feb. 28 1969 is related to the measures at the single frequency of 239 Mc/sec, in one polarization only, but with low and high resolution recording devices. The authors have pointed out the usefulness of the high resolution techniques for the studies of the microstructures of the radio outbursts which present, sometimes, a very interesting periodic fluctuation, stationary over limited time intervals. The studies on this subject is still in progress, and will be usefully integrated by the polarization measurements, when the polarimetric radiometers are completed. (Author)
AD-713 218 HC$3.00 MF$0.65

COSMIC-RAY MODULATION DURING FORBUSH DECREASES IN 1968-1969,
New Hampshire Univ Durham Dept of Physics
John A. Lockwood, and Partap Singh. Aug 70, 16p Rept no. Scientific-2 AFCRL-70-0470
Contract F19628-68-C-0107

Descriptors: (*Cosmic rays, Modulation), Plasma medium, Magnetosphere, Magnetic storms, Modulation, Scientific satellites, Neutron detectors, Spacecraft, Diurnal variations, Sun.
Identifiers: Forbush decrease, Solar cycle, Pioneer 8 spacecraft.

For several Forbush decreases in 1968-69 analyses have been made of the counting rate variations of neutron monitors at different vertical cutoff rigidities, of the different neutron multiplicities recorded by the Mt. Washington and Durham monitors, and of the cosmic ray telescope on Pioneer 8. Comparisons of the Forbush decrease changes with those for the 11-year variation indicate that the Forbush decreases are less rigidity dependent. From these data a possible form for the rigidity modulation is obtained. (Author)
AD-713 226 HC$3.00 MF$0.65

THE SOLAR CHROMOSPHERE AND HIGH ENERGY RADIATION.
Rept. for 1 Jul 69-30 Sep 70,
Michigan Univ Ann Arbor Dept of Astronomy
H. D. Prince. 30 Sep 70, 9p
Contract Nonr-1224 (19)

Descriptors: (*Chromosphere, Solar radiation), Reviews, Solar flares, Cosmic rays, Sunspots, Astronomical cameras, Stars.
Identifiers: A type stars, Umbra, Penumbra.

The report discusses work under the contract in the following areas. Studies in solar spectroscopy; Observations of sunspots; Studies of flares and flare-rich centers of activity; and Time variations in Solar activity.
AD-713 229 HC$3.00 MF$0.65

SOME APPLICATIONS OF DETAILED BALANCING,
Joint Inst for Lab Astrophysics Boulder Colo
For primary bibliographic entry see Field 20J.
AD-713 234

THE NATURE OF SOLAR FLARES,
Harvard Coll Observatory Cambridge Mass
Donald H. Menzel. 1969, 12p Rept no. Scientific-3 AFCRL-70-0481
Contract F19628-69-C-0077
Prepared in cooperation with Smithsonian Astrophysical Observatory, Cambridge, Mass.
Availability: Pub. in Proceedings of the Symposium on Solar Flares and Space Research, p363-367 1969.

Descriptors: (*Solar flares, Magnetohydrodynamics), Magnetic fields, Sunspots, Surface temperatures, Thermal stability, Mathematical models, Shock waves, Solar corona, Heat transfer.
Identifiers: Coronagraphs, Spicules.

A solution of the magnetohydrostatic equation, in the presence of a predominantly vertical but diverging magnetic field indicates that the gas pressure will have a minimum at the axis of the field. The density, however, along a level surface, shows surprisingly small variation. Hence, the temperature, which is proportional to the pressure divided by the density, will also show a minimum on the axis. The coolness of the spot, therefore, arises from the tendency of a magnetic region to come to static equilibrium. Regions of low temperature, however, imbedded in the hot solar surroundings will tend to warm up as the result of energy transfer by radiation or convection. We may, therefore, expect that the magnetic region will be somewhat warmer than the equilibrium value. The extra heating causes the material to flow out from the spot, along the lines of magnetic force. The resultant expansion of the gas tends to keep the spot cool. Conditions are somewhat more complex in the neighborhood of a bipolar spot. Each spot will independently pump ionized plasma out along the lines of force. This pumping action will lead to an increase in temperature and pressure in the region directly between the two spots where the magnetic lines of force of the two components join one another. The region appears to be unstable and a breakthrough of the lines of force will cause a solar flare, with associated shock waves. Motion pictures taken with the coronagraph at the Lockheed Solar Observatory illustrate the phenomenon. (Author)
AD-713 300

THE THEORY OF STELLAR WINDS AND RELATED FLOWS,
California Univ San Diego La Jolla Inst for Pure and Applied Physical Sciences
T. E. Holzer, and W. I. Axford. 1970, 30p AROD-5133:335-P
Contract DA-31-124-ARO (D)-257, Grant NGR-05-009-081
Sponsored in part by Grant NGR-05-009-075.
Availability: Pub. in Annual Review of Astronomy and Astrophysics, v8 p31-60 1970.

Descriptors: (*Solar wind, Mathematical models), Gas flow, Comets, Gravity, Entropy, Viscosity, Galaxies, Fluidics, Ionosphere, Interstellar matter, Conduction (Heat transfer).
Identifiers: *Stellar wind, Polar wind, Radial flow.

The report discusses certain aspects of steady, radial flows that are significant in astrophysics and space physics. The literature associated with the subject has of course been dominated by work on stellar winds in general and the solar wind in particular. The purpose is to show that the results are of wide applicability, and may be used in discussing not only stellar winds, but also galactic winds, comet winds, the polar wind (and related processes in planetary ionospheres), and the classical accretion problem. (Author)
AD-713 316

REDSHIFT DISTRIBUTION OF QUASISTELLAR RADIO SOURCES,
Stanford Univ Calif Inst for Plasma Research
Vahe Petrosian. 4 Apr 70, 7p Rept no. SU-IPR-361
Contract N00014-67-A-0112-0006
Availability: Pub. in Astrophysical Letters, v6 p71-75 1970.

Descriptors: (*Extraterrestrial radio waves, Doppler effect), Brightness, Galaxies, Stars, Distribution functions, Mathematical models.
Identifiers: *Quasars, *Red shift, Friedmann models, Cosmological constant, Integralactic medium, Lemaitre models.

Extrapolation of the density evolution and the luminosity function, obtained by Schmidt from the data on 3CR quasistellar sources, to larger redshifts, indicates a deficiency of observed sources with redshifts larger than 2 in Friedmann models with zero cosmological constant. The authors show that this cannot be due to observational selection effects. It may be caused by fairly rapid changes in the intrinsic properties of sources or in the intergalactic medium at epochs corresponding to this redshift. The cutoff is consistent with Lemaitre models without the requirement of such changes. (Author)
AD-713 385

DIRECTIONAL CHARACTERISTICS OF INFRARED EMISSION FROM THE MOON,
Boeing Scientific Research Labs Seattle Wash
D. F. Winter, and J. A. Krupp. Jul 70, 35p Rept no. D1-82-0987

Descriptors: (*Moon, Infrared radiation), Thermal radiation, Surface properties, Extraterrestrial topography, Soil mechanics, Heat transfer, Emissivity, Albedo (Astronomy), Temperature, Brightness.

Infrared surveys of the illuminated Moon have shown that the lunar surface does not radiate like a Lambert emitter. A detailed description is presented of directional emission from the equatorial region of the Moon, based on brightness temperature measurements by Saari and Shorthill. In general, the measurements indicate that the illuminated lunar surface is anomalously warm (cool) when the Sun is behind (in front of) the observer. It is plausible to attribute such directional effects to negative surface relief. A thermal model of a cratered lunar soil is developed to examine these effects both qualitatively and quantitatively. The results of the study indicate that centimeter- and meter-scale craters, with a variety of forms, both sharp and subdued, can account for measured directional emission characteristics over a wide range of Sun and observer angles. (Author)
AD-713 604 HC$3.00 MF$0.65

OPTIMALE DREIDIMENSIONALE GLEITFLUBBAHNEN BEIMEINTRITT IN PLANETENATMOSPHAEREN (Optimal Three-Dimensional Flight Paths for Entry into Planetary Atmospheres),
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Oberpfaffenhofen (West Germany)
For primary bibliographic entry see Field 22C.
AD-713 646

RESULTS OF IN-FLIGHT SHADOWING PERFORMED ON THE ESRO ROCKET OF 7 JUNE 1968,
Air Force Cambridge Research Labs L G Hanscom Field Mass
For primary bibliographic entry see Field 4A.
AD-713 658

THE SECULAR ACCELERATION OF THE MOON,
Naval Observatory Washington D C
Thomas C. Van Flandern. 30 Mar 70, 2p Rept no. NOBS-Reprint-110
Availability: Pub. in Astronomical Jnl., v75 n5 p657-658 Jun 70.

Descriptors: (*Moon, Acceleration), Ephemerides, Stars, Tides.
Identifiers: Lunar occulation, Librations.

If it is assumed that Atomic Time is a uniform time scale over a few decades, then one may analyze the behavior of the mean longitude of the moon against that time scale. Previously, the moon's mean longitude was used to determine Ephemeris Time; and systematic trends were undetectable, being completely absorbed into the time scale. An extensive analysis of occultations of stars by the moon between 1955 and 1969, since Atomic Time has been available, indicates a residual secular acceleration in addition to the previously assumed tidal acceleration determined by Spencer-Jones, and the dynamical acceleration determined by Brown. Possible causes of this residual acceleration include: (1) additional tidal acceleration; (2) long-period deficiencies in the lunar theory; (3) secular variation in length of the Atomic second relative to the Ephemeris second. (Author)
AD-713 663

THE MASSES OF SATURN AND URANUS,
Naval Observatory Washington D C
W. J. Klepczynski, P. K. Seidelmann, and R. L. Duncombe. 1 Apr 70, 9p Rept no. NOBS-Reprint-114
Availability: Pub. in Astronomical Jnl., v75 n6 p739-742 Aug-n1381 1970.

Descriptors: (*Uranus (Planet), Weight), (*Saturn (Planet), Weight), Celestial mechanics, Ephemerides, Neptune (Planet), Equations of motion, Gravity.

Based on observations of Jupiter (1913-1968), the reciprocal mass of Saturn was determined to be 3498.7 plus or minus 0.2 (m.e.). Based on observations of Saturn (1913-1968), the reciprocal mass of Uranus was determined to be 22692 plus or minus 33 (m.e.). These are in contrast to the adopted values of 3501.6 and 22869, respectively. (Author)
AD-713 684

SOME NOTES ON THE USE OF THE WATTS-LIMB-CORRECTION CHARTS,
Naval Observatory Washington D C
Thomas C. Van Flandern. 11 May 70, 744p Rept no. NOBS-Reprint-113
Availability: Pub. in Astronomical Jnl., v75 n6 p744-746 Aug-n1381 1970.

Descriptors: (*Moon, Motion), Stars, Precession, Perigee, Oscillation, Accuracy.
Identifiers: Lunar occulation, Librations.

Reductions of grazing and total occulations of stars by the moon have been greatly aided by the availability of corrections for limb irregularities from the charts of the marginal zone of the moon compiled by C. B. Watts (1963). These corrections have led to reductions of typical total occulation residuals by a factor of 2, to the removal of many important sources of systematic error in the determination of lunar elements, and to the possibility of observing and reducing extreme grazing occulations. (Author)
AD-713 685

INVESTIGATION OF THE PHOTOMETRIC RESPONSE OF THE MOON AND THE PLANETS.
Final rept. 14 May 68-30 Jun 70,
Hawaii Univ Honolulu Inst for Astronomy
William M. Sinton. Jul 70, 10p AFCRL-70-0435
Contract F19628-68-C-0332

Descriptors: (*Moon, Thermal radiation), (*Planets, Infrared spectroscopy), Brightness, Interferometers, Mars (Planet), Jupiter (Planet), Atmospheric refraction, Hawaii, Comets, Dust, Band spectrum, Solar radiation, Astronomical observatories, Photometers.
Identifiers: Tago-Sato-Kosaka comet, Io moon.

An observatory consisting of a 24-inch telescope was established and operated at 13,700 feet elevation on Mauna Kea, Hawaii. The thermal radiation properties of the Moon have been studied BY AFCRL scientists. The photometric properties of Mars, Jupiter satellites, and Comet Tago-Sato-Kosaka (1969g) have been studied by University of Hawaii scientists. The atmospheric transmission to submillimeter radiation has also been investigated with a high resolution interferometer. (Author)
AD-713 688 HC$3.00 MF$0.65

ON THE VELOCITY PROFILE OF THE MOON,
Michigan Univ Ann Arbor Inst of Science and Technology
V. Sh. Berikashvili, V. N. Zharkov, and T. B. Yanovskaya. 1970, 23p Rept no. VESIAC-13313
Contract SD-78
Trans. of Akademiya Nauk SSSR. Izvestiya. Fizika Zemli, n7 p9-21 1965. Also available as TT-65-32660.

Descriptors: (*Moon, Seismic waves), (*Seismic waves, Velocity), Models (Simulations), Temperature, Pressure, Density, Structural geology, USSR.
Identifiers: Translations, Seismic profiles, *Lunar geology, Lunar interior.

The question of the distribution of the velocities of P and S waves in the depths of the moon is examined. Use is made of the results of laboratory measurements of the influence of pressure, temperature and composition on the velocity of elastic waves in rocks, and also data on the distribution of P and S waves in the upper layers of the earth. It appeared that the moon should have an anomalously broad layer of reduced velocities. The reason for this is that the critical temperature gradient for the formation of a slow-velocity layer is proportional to the acceleration of gravity g, and on the moon this value is one-sixth as large as on earth. The question of the possibility of a disturbance of the Wiechert conditions below the lunar surface was investigated. It appeared that the probability of a disturbance of these conditions is small, although it also cannot be ruled out. Time-distance and amplitude curves were constructed for the proposed distributions of P and S waves below the lunar surface. An analogous investigation was conducted for a model of the moon with a liquid core. (Author)
AD-713 725 HC$3.00 MF$0.65

PHOTOMETRIC MAP OF THE MILKY WAY,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
L. L. Smith, F. E. Roach, and R. W. Owen. Jun 70, 32p
Contract AT (45-1)-1830

Descriptors: (*Milky way, Brightness), (*Photometry, Mapping), Luminance, Zodiacal light, Nightglow, Galactic radiation, Cosmic rays, Experimental data, Night sky.

For abstract, see NSA 24 20.
BNWL-1419 HC$3.00 MF$0.65

VELA V AND VI SOLAR X-RAY ATLAS. I. MAY 27-SEPTEMBER 1, 1969,
Los Alamos Scientific Lab., N. Mex.
N. K. Blocker, W. H. Chambers, P. E. Fehlau, J. C. Fuller, and W. E. Kunz. Jun 70, 100p
Contract W-7405-eng-36

Descriptors: (*Solar x rays, Atlases), Scientific satellites, Graphs (Charts), Scintillation counters, Photomultipliers, Pulse height analyzers, Real time, Calibration.
Identifiers: Vela 5 satellite, Vela 6 satellite.

For abstract, see NSA 24 20.
LA-4454 HC$3.00 MF$0.65

NONLINEAR EFFECTS IN QUANTUM ELECTRODYNAMICS. PHOTON PROPAGATION AND PHOTON SPLITTING IN AN EXTERNAL FIELD,
Pennsylvania Univ., Philadelphia. Dept. of Physics.
For primary bibliographic entry see Field 20J.
For abstract, see NSA 24 20.
NYO-3829-54 HC$3.00 MF$0.65

EXPERIMENTAL INVESTIGATION OF ULTRAHIGH VACUUM ADHESION AS RELATED TO THE LUNAR SURFACE, FIFTH YEAR SUMMARY FINAL REPORT, 1 JAN. 1969 - 19 JUN. 1970.
Mcdonnell-douglas Astronautics Co., Huntington Beach, Calif.
J. J. Grossman, J. A. Ryan, and M. W. Wegner. 30 Sep 70, 57p NASA-CR-112967, MDC-G-1403
Contract NAS7-307

Descriptors: *Adhesion tests, *Lunar soil, *Silicates, *Ultrahigh vacuum, Bonding, Crystal structure, Etching, Polycrystals.

For abstract, see STAR 08 21.
N70-38148 HC$3.00 MF$0.65

A GENERAL SURVEY OF CLASSICAL CEPHEID VARIABLE STARS.
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
R. M. Wilson. 16 Sep 69, 89p NASA-TM-X-53920, MSFC-IN-SSL-T-68-16

Descriptors: *Cepheid variables, *Infrared astronomy, *Interstellar matter, *Stellar spectra, Light speed.

For abstract, see STAR 08 21.
N70-38166 HC$3.00 MF$0.65

HEAT TRANSFER IN THE CONVECTIVE ENVELOPE OF THE SUN.
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
K. Schocken. 16 Sep 69, 18p NASA-TM-X-53928, MSFC-R-SSL-INT-67-8

Descriptors: *Convective heat transfer, *Photons, *Solar flux, *Thermodynamic equilibrium, Adiabatic conditions, Radiative heat transfer, Temperature gradients, Transport properties.

For abstract, see STAR 08 21.
N70-38381 HC$3.00 MF$0.65

ON THE INFERENCE OF THE PHYSICAL PROPERTIES OF THE JOVIAN ATMOSPHERE FROM PHOTOMETRY OF ECLIPSES OF THE GALILEAN SATELLITES.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
M. J. Price. Sep 70, 60p NASA-TR-R-345

Descriptors: *Eclipses, *Jupiter atmosphere, *Natural satellites, *Photometry, Atmospheric physics, Atmospheric refraction, Saturn (planet).

For abstract, see STAR 08 21.
N70-38814 HC$3.00 MF$0.65

SPECTRUM FORMATION IN STARS WITH STEADY-STATE EXTENDED ATMOSPHERES,
National Bureau of Standards, Washington, D.C.
H. G. Groth, and P. Wellmann. Aug 70, 343p NBS-SP-332
Proceedings of the International Astronomical Union Colloquim No. 2, Commission 36, Munich (Germany) 16-19 Apr 69. Paper copy also available from Superintendent of Documents, GPO, Washington, D.C. 20402. $1.75 as C13.10:332.

Descriptors: (*Stellar atmospheres, Stellar spectra), (*Stellar spectra, Proceedings), Spectrum signatures, Spectrum analyzers, Chromosphere, Absorption spectra, Meetings.

Commission 36 of the International Astronomical Union sponsored a symposium on Spectrum Formation in Extended Stellar Atmospheres held 16 - 19 April, 1969. The host was the Observatory of the University of Munich. A major problem is the definition of which is meant by an extended stellar atmosphere. There are intuitive notions in the literature, but the question of specific definitions in various kinds of objects was discussed. Questions of what specifically cause the anomalous extent were largely by-passed. Attention focused mainly on the type spectrum to be expected in various situations. The spectral features to be expected in both static and dynamic atmospheres, including and excluding departures from LTE, were discussed. The symposium was divided into four section: A. Type of Problems Which Exist; B. Theoretical Methods for Handling Non-LTE Problems; C. Chromospheres and Coronae of Stars; D. Summary. (Author)
PB-194 959 HC$1.75 MF$0.65

3C. Celestial Mechanics

BULLETIN OF THE RADIO AND ELECTRICAL ENGINEERING DIVISION OF THE NATIONAL RESEARCH COUNCIL OF CANADA. VOLUME 20, NUMBER 2, APRIL-JUNE 1970.
National Research Council of Canada Ottawa (Ontario) Radio and Electrical Engineering Div
For primary bibliographic entry see Field 9C.
AD-713 683

4. ATMOSPHERIC SCIENCES

4A. Atmospheric Physics

AURORAL OVAL PLOTTER AND NOMOGRAPH FOR DETERMINING CORRECTED GEOMAGNETIC LOCAL TIME, LATITUDE, AND LONGITUDE FOR HIGH LATITUDES IN THE NORTHERN HEMISPHERE.
Environmental research papers,
Air Force Cambridge Research Labs L G Hanscom Field Mass
James A. Whalen. 27 Jul 70, 31p Rept nos.
AFCRL-70-0422, AFCRL-ERP-327

Descriptors: (*Aurorae, Nomographs), Corrections, Terrestrial magnetism, Accuracy, Ionosphere, Arctic regions.
Identifiers: Coordinates, Auroral oval.

A nomographic computer is presented which graphically converts geographical coordinates and universal time into geomagnetic coordinates and geomagnetic local time in the Corrected Geomagnetic system of Hultqvist. The computer is formulated as a map of high latitudes in the Northern Hemisphere on which the position of the auroral oval can be projected directly for any time of day, for any magnetic activity, with account being taken of seasonal variation of the geomagnetic local time coordinate. Instructions for its use, discussion of its accuracy, and examples of its application are given. (Author)
AD-713 170 HC$3.00 MF$0.65

INTERNATIONAL SYMPOSIUM ON EQUATORIAL AERONOMY (3rd) HELD AT AHMEDABAD (INDIA) ON FEBRUARY 3-10, 1969,
Physical Research Lab Ahmedabad (India)
Kalpathi R. Ramanathan, and Pisharoth R. Pisharoty. 14 May 70, 18p Rept no. ISEA/73
AFCRL-70-0530
Grant EOOAR-69-0057
See also AD-697 632.

Descriptors: (*Upper atmosphere, *Symposia), Electron density, Tropical regions, Magnetic fields, Ionospheric disturbances, Charged particles, Interactions, Synchronous satellites, Sounding rockets, Sunspots, Probes, Ionospheric propagation, Radio waves, Absorption, Reports, India.
Identifiers: D region, E region.

The report is of a Symposium on Equatorial Aeronomy held at Ahmedabad, India, February 3-10, 1969. The subjects covered included the constitution, morphology and behaviour of the upper atmosphere over the equatorial belt, with particular reference to the region between altitudes of 50 and 1000 km. The electrical properties, chemical and photo-chemical processes, optical emissions and their relation to solar and other extra-terrestrial phenomena were included. Extended abstracts, together with diagrams of the new work presented at the meeting have been published as Proceedings of the Symposium in 2 volumes. (Author)
AD-713 199 HC$3.00 MF$0.65

TAETIGKEITSBERICHTE 1969. FAHGEBIET 6: FLUGRAUMPHYSIK, RAUMSIMULATION, FLUGMEDIZIN (Activity Report 1969. Division 6: Space Flight Physics, Space Simulation, Flight Medicine),
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Porz-Wahn (West Germany)
For primary bibliographic entry see Field 22A.
AD-713 212

INVESTIGATION OF THE INFRARED EMISSION SPECTRUM OF THE ATMOSPHERE AND EARTH. ROCKET-BORNE RADIOMETERS FOR MEASUREMENTS OF THE ATMOSPHERIC INFRARED RADIATION.
Final rept.,
Munich Univ (West Germany) Meteorologisches Institut
W. Bangert, H.-J. Bolle, P. Burkert, and D. Rabus. Mar 70, 26p Rept no. Scientific-1 AFCRL-70-0376
Contract F61052-68-C-0026

Descriptors: (*Atmosphere, Infrared radiation), (*Gas flow, Measurement), Radiometers, Sounding rockets, Free radicals, Hydrogen compounds, Oxides, West Germany.
Identifiers: Remote sensing, Aerobee, Hydro-,, radical.

During the contracting period the radiometers for the 1970 Aerobee experiment have been designed and built. Two of the radiometers have been tested in a ballon flight experiment using the AFCRL Balloon Borne Solar Pointer BBSP 2oo. The electronic system for the rocket experiment has been constructed by Ball Brothers Corporation. The solar pointing control SPCS-2 for the Aerobee rocket was also ordered from Ball Brothers Corporation. A performance test for this system was performed in August 1969. A filter radiometer has been designed for measuring the OH airglow emission height profile from aboard the Aerobee rocket. Construction of a prototype instrument is still under way. Therefore only tests on various components have been carried out so far. (Author)
AD-713 219 HC$3.00 MF$0.65

IONOSPHERIC DATA REPORT - MAY 1970.
Military Research and Development Center Bangkok (Thailand)
For primary bibliographic entry see Field 20N.
AD-713 247 HC$3.00 MF$0.65

OBSERVATIONS OF RAIN AND HAIL GUSHES AFTER LIGHTNING,
Little (Arthur D) Inc Cambridge Mass
For primary bibliographic entry see Field 4B.
AD-713 255 HC$3.00 MF$0.65

THUNDERSTORM ELECTRICITY,
Little (Arthur D) Inc Cambridge Mass
Bernard Vonnegut. 31 Jan 62, 36p

Sponsored in part by the Office of Naval Research, Washington, D. C., Bureau of Naval Weapons, Washington, D. C., Advanced Research Projects Agency, Washington, D. C. and National Science Foundation, Washington, D. C. Presented at the AMS Sever Storm Conference, Norman, Okla., 13 Feb 62.

Descriptors: (*Atmospheric electricity, *Thunderstorms), Cumulus clouds, Raindrops, Interactions, Crystal growth, Ice, Lightning, Electric currents, Heating, Tornadoes, Cumulonimbus clouds, Convection (Atmospheric).

Contents: Nature of cloud electrification; (Types of clouds exhibiting strong electrification, initiation of electrification process, potential gradients, space charge, potentials, electrical energy and power, electric currents); Role of cloud electrification; (Influence on formation of precipitation, prevention of drop bounce-off, promotion of drop collisions and increase of collection efficiency, prevention of drop collisions, promotion of drop breakup, acceleration of ice crystal growth, effect of lightning); (Influence on dynamics, electric force per unit area, electrical acceleration of air, electrical heating and tornadoes).
AD-713 260 HC$3.00 MF$0.65

THE HIGH-LATITUDE F-REGION IRREGULARITY STRUCTURE DURING THE OCTOBER 30-NOVEMBER 4, 1968, MAGNETIC STORM.
Interim rept.,
Air Force Cambridge Research Labs L G Hanscom Field Mass
Jules Aarons. 10 Dec 69, 9p Rept no. AFCRL-70-0518
Availability: Pub. in Radio Science, v5 n6 p959-966 Jun 70.

Descriptors: (*Ionosphere, Boundary layer), (*Ionospheric propagation, *Magnetic storms), Scintillation, Radio waves, Ionospheric disturbances, Very high frequency, Attenuation, Scientific satellites.
Identifiers: ATS 3 satellite, Explorer 22 satellite, *F region.

A study of multi-station scintillation observations of the 137-MHz transmissions from ATS-3 during the magnetic storm of October 30 to November 4, 1968, was made to separate the diurnal pattern of high-latitude irregularities from storm-time effects. The night maximum was maintained during magnetic storms, but the pattern was modulated by storm-time effects. Daytime scintillation indices were increased at specific times during the magnetic storm; a universal time correlation was observed for stations in Europe and in North America. Peak scintillation activity shifted from before midnight (under quiet magnetic conditions) to the 0130 to 0430 time period. A sharp boundary of less than 2 degrees was noted between scintillating and non-scintillating regions. 40-MHz transmissions from Explorer 22 during one period of the storm verified that the irregularity structure extended from 48 to 50 degrees GN to auroral latitudes. Using records of 54-MHz transmissions from Transit 4A taken between 1962 and 1965, as well as the ATS-3 data, it was found that during magnetic storms the lower edge of the scintillation boundary, which bounds the irregularity structure, moves below its quiet positions to lower latitudes, particularly in the midnight-to-dawn time period. It was found that the observations were more adequately ordered by invariant latitudes than geomagnetic (dipole) latitudes used in scintillation papers. (Author)
AD-713 363

CAT AT A SUBSIDENCE INVERSION: A CASE STUDY,
Air Force Cambridge Research Labs L G Hanscom Field Mass
Roland J. Boucher. 12 Mar 70, 5p Rept no. AFCRL-70-0519
Revision of report dated 29 Dec 69.
Availability: Pub. in Jnl. of Applied Meteorology, v9 n3 p534-537 Jun 70.

Descriptors: (*Clear air turbulence, Reviews), Tropopause, Stability, Temperature inversion, Meteorological radar, Detection, Radar echo areas, Atmospheric sounding.
Identifiers: Baroclinic layers.

Moderate clear air turbulence (CAT) encountered by a probing aircraft at about 5.5 km and exhibiting a wavy clear air radar echo is shown to be occurring in a strong, descending subsidence inversion accompanied by a wind shear in excess of 0.2/sec. (Author)
AD-713 371

SATELLITE OBSERVATIONS OF LIGHTNING,
Minnesota Univ Minneapolis School of Physics and Astronomy
J. A. Vorpahl, J. G. Sparrow, and E. P. Ney. 24 Jun 70, 4p
Contract N00014-67-A-0113-0004, Grant NGL-24-005-008
Prepared in cooperation with California Univ., Berkeley, Dept. of Physics.
Availability: Pub. in Science, v169 p860-862, 28 Aug 70.

Descriptors: (*Lightning, Detection), Thunderstorms, Photometers, Cloud cover, Sea water, Terrain, Scientific satellites.
Identifiers: OSO B satellite.

Analysis of the positions of nighttime thunderstorms as determined from the detection of optical radiation by satellite OSO-B reveals that ten times as many lightning storms occur over land areas as over the sea. (Author)
AD-713 405

IONOSPHERIC DATA REPORT - JUNE 1970.
Military Research and Development Center Bangkok (Thailand)
For primary bibliographic entry see Field 20N.
AD-713 490 HC$3.00 MF$0.65

A SIMILARITY MODEL FOR ATMOSPHERIC TURBULENCE STRUCTURE IN THE PLANETARY BOUNDARY LAYER,
Army Electronics Command Fort Huachuca Ariz Atmospheric Sciences Lab
William D. Ohmstede. 1970, 14p

Descriptors: (*Atmospheric motion, Boundary layer), Mathematical models, Heat flux, Turbulence, Diffusion.
Identifiers: Planetary boundary layer.

The planetary boundary layer, the lowest 1000 meters of the atmosphere, is of special interest because most Army operations and materiel function within it. This layer of air is characteristically turbulent. This property not only affects the overall behavior of the layer, but also directly influences Army operations and materiel. Meaningful measurements of atmospheric turbulence are difficult to obtain, and techniques must be developed for assessing the turbulence structure from simple observations or, in some cases, no observations at all. The report discusses numerical solutions of energy and transport equations in the planetary boundary layer.
AD-713 569 HC$3.00 MF$0.65

A MERIDIONAL MODEL OF THE OXYGEN-HYDROGEN ATMOSPHERE.
Special rept.,
Oslo Univ (Norway) Inst of Geophysics
Eigil Hesstvedt. Aug 70, 30p ARDG (E)-E-1282
Contract DAJA37-69-C-0011

Descriptors: (*Upper atmosphere, Chemical properties), Oxygen, Hydrogen, Heat flux, Transport properties, Photochemistry, Mesosphere, Mathematical models, Chemical reactions, Norway.

A meridional model of the oxygen-hydrogen atmosphere between 65 km and 105 km is presented. Vertical transport, by eddies and by mean motion, is considered, while horizontal transport is disregarded. Sources and sinks of heat are computed. It is concluded that the horizontal variations in the chemical composition are relatively small. The chemical composition of the upper mesosphere and lower thermosphere is therefore believed to be largely determined by photochemistry and vertical transport. (Author)
AD-713 621 HC$3.00 MF$0.65

RESULTS OF IN-FLIGHT SHADOWING PERFORMED ON THE ESRO ROCKET OF 7 JUNE 1968,
Air Force Cambridge Research Labs L G Hanscom Field Mass
R. A. Skrivanek, R. F. Carnevale, and R. D. Sarkisian. 1970, 7p Rept no. AFCRL-70-0557
Availability: Pub. in Space Research, v10 p281-286 1970.

Descriptors: (*Meteors, Collecting methods), Comets, Electron microscopes, Experimental design, Sounding rockets.
Identifiers: Interplanetary dust, Inflight shadowing systems, ESRO rockets.

Results of electron microscopic examination of in-flight shadowed substrates obtained during a rocket flight on 7 June 1968 are discussed. In-flight shadowing was performed in three intervals: the first at the opening of the collector module; the next 32 sec later and the final one 98 sec after opening. The open event shadow was poorly defined, which is attributed to a localized increase in the dynamic pressure. Collection within the interval 32 to 98 sec is defined by very distinct shadows, and particles of 0.01 micrometer are easily detectable. For this increment the number of singly shadowed particles is approximately 170 particles per cm. squared, for particles larger than 0.1 micrometer. These results are a factor of 20 lower than the concentration of singly shadowed particles measured on a non-in-flight shadowed surface from the same rocket flight. Based on the in-flight shadowing results, a flux of 1.7 particles per cm. squared sec. is calculated for particles larger than 0.1 micrometer. (Author)
AD-713 658

NEUTRAL WINDS AND THE BEHAVIOR OF THE IONOSPHERIC F2 REGION,
Illinois Univ Urbana Ionosphere Radio Lab
H. R. Cho, and K. C. Yeh. 28 Jan 70, 15p AFCRL-70-0578
Contract F19628-67-C-0028
Revision of report dated 20 Nov 69.
Availability: Pub. in Radio Science, v5 n6 p881-894 Jun 70.

Descriptors: (*Ionosphere, Electron density), Anomalies, Atmosphere models, Simulation, Temperature, Drag, Ionization, Equations of motion.
Identifiers: *F2 region.

The continuity equation of ionization and the equation of motion of the neutral atmosphere are solved simultaneously in the ionospheric F2 region for different seasons in different epochs of solar activity. The model atmosphere used is that given by L. G. Jacchia (1965). Epstein functions are used to simulate the electron and ion temperature profiles. An ionization production function in a Jacchia model atmosphere is derived and used. The computed wind velocity and (f sub 0) F2 behavior are presented and compared with other theoretical results as well as the existing experimental data. The meridional wind is found to agree reasonably well with the incoherent scatter data. It is found that the declination effect resulting from neutral winds can be used to explain certain experimental observations in semiquantitative manner. (Author)
AD-713 660

WINTERTIME DENSITY VARIABILITY IN THE UPPER ATMOSPHERE OBTAINED FROM ROCKET MEASUREMENTS AT WHITE SANDS, NEW MEXICO,
Air Force Cambridge Research Labs L G Hanscom Field Mass
A. C. Faire, E. A. Murphy, and O. W. Thiele. 1970, 11p Rept no. AFCRL-70-0556
Availability: Pub. in Space Research, v10 p188-197 1970.

Descriptors: (*Upper atmosphere, Density), Sounding rockets, Falling bodies, Spheres, Mesosphere, Atmospheric sounding, Guided missile ranges, New Mexico.
Identifiers: White Sands (New Mexico), Winter.

High-altitude density data from five falling sphere rocket experiments launched at White Sands, New Mexico, during the winter of 1967 are presented and discussed. In order to investigate short-term variability of upper atmosphere density, four of the five rockets were launched during the 12 1/2 hr period between 0000 and 1225 hr MST on 23 January. The vertical profiles of density obtained from these four consecutive measurements revealed considerable variations with respect to each other and to the appropriate model atmospheres with which they were compared. Near an altitude of 76 km the density departures relative to the U.S. Standard Atmosphere Supplements, 1966, varied from -30% at 0300 hr to -10% at 1225 hr. During the same time interval, in the vicinity of 96 km, the departures varied from +16 to +60%, an interesting and unexpected result. The fifth rocket was launched at 1145 hr on 26 January, thus affording an opportunity to observe relatively long-term variations in density-height profiles obtained three days apart. The large density variations observed in the mesosphere and lower thermosphere are discussed in terms of possible dynamical processes. (Author)
AD-713 661

A10 RESONANT SPECTRA AND TEMPERATURE MEASUREMENT OF THE THERMOSPHERE. PART II. DEDUCED TEMPERATURE PROFILES AT A HIGH LATITUDE.
Final scientific rept. no. 2, 1 Feb 66-31 Mar 70,
Auroral Observatory Tromso (Norway)
Ove E. Harang. 30 Apr 70, 28p AFCRL-70-0442
Contract AF 61 (052)-906
See also Part 1, AD-690 161.

Descriptors: (*Upper atmosphere, Atmospheric temperature), (*Atmospheric temperature, Measurement), (*Atmospheric sounding, *Molecular spectroscopy), Aluminum compounds, Monoxides, Spectra (Visible + ultraviolet), Band spectrum, Solar spectrum, Resonance absorption, Norway.
Identifiers: Chemical release studies, Aluminum oxides, Thermosphere, Emission spectra.

In January and August 1968 a series of rocket release experiments for upper atmosphere structure were performed. These experiments involve density profile and wind profile measurements and also measurements of atomic oxygen, both the neutral density profile and the emission profile of the oxygen line OI (5577). The experiments consisted of chemical releases of nitrogen oxide (NO) and Trimetyl Aluminium (TMA). The TMA release during twilight gave spectra of the A squared sigma minus X squared sigma transition of molecular A10. These spectra were taken from different altitudes and when analyzed, gave temperature profile of the thermosphere. Measured temperature profiles from these experiments were compared with the COSPAR International Reference Atmosphere of 1965 (CIRA 1965) and also compared with the US Standard Atmosphere Supplement of 1966. (Author)
AD-713 676 HC$3.00 MF$0.65

BASIC PROCESSES AND CROSS SECTIONS IN PROTON AURORAS.
Rept. for 15 May-15 Aug 70
Aerospace Corp El Segundo Calif Lab Operations
Robert J. McNeal, and John H. Birely. 8 Sep 70, 18p Rept no. TR-0059 (9260-01)-10 SAMSO-TR-70-372
Contract F04701-70-C-0059

Descriptors: (*Aurorae, Protons), Ionization, Excitation, Differential cross section, Interactions, Graphics, Hydrogen.
Identifiers: Lyman alpha radiation.

A proton aurora is a weak, diffuse emission readily identified by Doppler-shifted hydrogen lines in its spectrum. It is caused by precipitation of protons with a broad energy distribution that peaks near 1 ke V. For theoretical analysis of this aurora, cross sections for ionization and excitation of atmospheric constituents by energetic protons and hydrogen atoms are needed over a wide energy range. Recent measurements of these cross sections are reviewed in this paper, and preliminary results from this laboratory for excitation of some of the hydrogen emissions are reported. (Author)
AD-713 691 HC$3.00 MF$0.65

SYNOPTIC PREVIEW OF IONOSPHERIC DATA TAKEN AT FORT MONMOUTH, NEW JERSEY, DURING THE ECLIPSE,
Army Electronics Command Fort Monmouth N J Inst for Exploratory Research
P. R. Arendt, F. Gorman, Jr., and H. Soicher. 27 Apr 70, 2p
Availability: Pub. in Nature, v226 n5251 p1114, 20 Jun 70.

Descriptors: (*Ionosphere, Electron density), (*Ionospheric disturbances, *Solar eclipses), Polarization, Scientific satellites, Ionization, New Jersey.
Identifiers: ATS 3 satellite, Beacon Explorer A satellite, Alouette 1 satellite.

Various ionospheric observations were made at Fort Monmouth during the eclipse of March 7. These included a readout from the topside sounder satellite Alouette 1, polarization and signal strength measurements from beacons in the S-66 and ATS-3 satellites, and bottomside ionograms from various locations. This letter is a preliminary view of how data from the ATS-3 observations are related to the vertical ionogram data obtained at Wallops Island. (Author)
AD-713 733

RESULTS OF AEROLOGICAL OZONE SOUNDINGS AT THE HOHENPEISSENBERG METEOROLOGICAL OBSERVATORY.
Final rept. (Part 4) Jan-Dec 68,
Politecnico Di Milano (Italy) Istituto Di Chimica Fisica Elettrochimica E Metallurgia
Walter Attmannspacher. Apr 70, 143p AEDG (E)-E-1093-Pt-4
Contract DAJA37-67-C-0317
See also Part 2, AD-701 922.

Descriptors: (*Atmospheric sounding, West Germany), (*Ozone, Measurement), Networks, Radiosondes, Stratosphere, Troposphere, Tables.

These special reports present a mass of data in tabular and map form taken at Hohenpeissenberg for 1968, taken at different levels during the passage of storms and fronts. Included are: ozone tables and ozonagrams; tables of ascent data including those for temperatures, pressures and winds aloft. (Author)
AD-713 804 HC$3.00 MF$0.65

PARTICLE SIZE DISTRIBUTION OF CHLORINE AND BROMINE IN MID-CONTENT AEROSOLS FROM THE GREAT LAKES BASIN,
Michigan Univ., Ann Arbor. Dept. of Meteorology and Oceanography.
For primary bibliographic entry see Field 13B.
For abstract, see NSA 24 20.
COO-1705-5 HC$3.00 MF$0.65

4B. Meteorology

SUMMARY OF SYNOPTIC METEOROLOGICAL OBSERVATIONS. MEDITERRANEAN MARINE AREAS. VOLUME 7. AREA 24 - N. AEGEAN SEA, AREA 25 - S. AEGEAN SEA, AREA 26 - CRETE, AREA 27 - BENGHAZI.
Naval Weather Service Command Washington D C
Oct 70, 641p
See also Volume 8, AD-713 085.

Descriptors: (*Marine meteorology, Seacoast), (*Meteorological parameters, *Mediterranean Sea), Atmospheric precipitation, Ceiling, Visibility, Wind, Fog, Hail, Velocity, Cloud cover, Atmospheric temperature, Humidity, Weather forecasting, Naval shore establishments, Tables.
Identifiers: Aegean Sea, Crete, Benghazi, Air water interactions.

The data contained in these tables were obtained from tape data Family 11 (TDF-11), Marine Surface observations. TDF-11 was primarily funded by the Naval Weather Service Command and selected by NWSED Asheville as the most comprehensive collection of marine surface observations from which to develop a series of coastal marine summaries. The areas discussed include the Crate and Benghazi.
AD-713 084 HC$10.00 MF$0.65

SUMMARY OF SYNOPTIC METEOROLOGICAL OBSERVATIONS. MEDITERRANEAN MARINE AREAS. VOLUME 8. AREA 28 - RHODES, AREA 29 - CENTRAL LEVANTINE BASIN, AREA 30 - ALEXANDRIA, AREA 31 - N. CYPRUS.
Naval Weather Service Command Washington D C

Oct 70, 641p
See also Volume 7, AD-713 084 and Volume 9, AD-712 761.

Descriptors: (*Marine meteorology, Mediterranean Sea), (*Meteorological parameters, Egypt), (*Cyprus, Meteorological parameters), Atmospheric precipitation, Ceiling, Visibility, Wind, Fog, Velocity, Hail, Snow, Cloud cover, Atmospheric temperature, Humidity, Naval shore establishments, Tables.
Identifiers: Alexandria (Egypt), Lenantine Basin, Air water interactions, *Rhodes Island.

The data contained in these tables were obtained from tape data Family 11 (TDF-11), Marine Surface observations. TDF-11 was primarily funded by the Naval Weather Service Command and selected by NWSED Asheville as the most comprehensive collection of marine surface observations from which to develop a series of coastal marine summaries. The areas included are Rhodes, Central Lavatine Basin, Alexandria (Egypt), and North Cyprus.
AD-713 085 HC$10.00 MF$0.65

AFGWC MACRO-SCALE UPPER AIR ANALYSIS MODEL.
Technical memo.,
Air Force Global Weather Central Offutt AFB Nebr
August L. Shumbera. 15 Mar 70, 31p Rept no. AFGWC-TM-70-2

Descriptors: (*Weather forecasting, *Upper atmosphere), Mathematical models, Atmospheric temperature, Altitude, Wind, Dew point, Barometric pressure, Stability, Vortices, Corrections, Numerical analysis.
Identifiers: AFGWC (Air Force Global Weather Central), Air Force global weather central, Numerical weather forecasting.

The AFGWC macro-scale numerical upper air analysis program for the Northern Hemisphere is described. The program produces wind, height and temperature analyses at 14 levels from 850 to 10 mbs, and moisture analyses at four levels, from 850 to 400 mbs. A detailed explanation of the derivation of first guess fields is presented. The analysis technique is the method of successive corrections to a first guess field. Constraints are applied to the stability of each layer. Radiation type corrections are applied above 100 mb to observations taken in daylight to remove instrumental errors. (Author)
AD-713 119 HC$3.00 MF$0.65

OCTOBER CLIMATE OF SOUTHEAST ASIA.
Final climatological study.
Weather Wing (1st) Apo San Francisco 96553

Sep 70, 69p Rept no. 1WW-Special Study-105-11/10
Revision of Report dated Jul 66, AD-487 395.

Descriptors: (*Climatology, *Southeast Asia), Atmospheric precipitation, Thunderstorms, Cloud cover, Visibility, Ceiling, Atmospheric temperature, Humidity, Wind, Tropical cyclones, Upper atmosphere, Tropical regions, Marine meteorology, Weather forecasting, Naval shore establishments, Vietnam, Laos, Cambodia, Thailand.
Identifiers: North Vietnam, South Vietnam.

The report deals with the climate of North Vietnam, Republic of Vietnam, Laos, Cambodia, and Thailand for October. Essentially based on previously available data, however, precipitation analyses, ceiling/visibility, and upper air flow are new. Contains brief notes on the climate of Southeast Asia and the geographical features of the Republic of Vietnam, North Vietnam, Cambodia, Laos, and Thailand. Discusses the precipitation, thunderstorms, cloudiness, visibility and obstructions to vision, combined ceiling/visibility, temperature, relative humidity, surface and upper winds, miscellaneous phenomena and sea operations. Contains a station locator and topography map. Isoline analyses (map scale 1:9,000,000) are given for precipitation days, mean, maximum, and minimum precipitation, days with thunderstorm, mean cloudiness, percent frequency of ceiling/visibility greater than 5000/5 and greater than 1000/2 1/2 (7 and 16 LST), daily max and min temperatures and mean relative humidity. For selected stations tabular data on fog days, percent frequency visibility < 1 mile and < 5 miles (7 and 16 LST) are given also. Mean streamline charts (1:37,500,000) are given for 2,000 feet, 850 mb, 700 mb, 500 mb, 300 mb, and 200 mb levels. Also included are charts of mean position of polar front and ICZ 1:17,000,000) typhoon tracks (1:10,000,000), sea surface currents, temperatures, frequency of breakers, sea swell (1:10,000,000). (Author)
AD-713 120 HC$3.00 MF$0.65

A RADIO-METEOROLOGICAL INVESTIGATION OF FADING AT 2 GHz IN THE MEKONG DELTA.
Institute for Telecommunication Sciences Boulder Colo
For primary bibliographic entry see Field 17B.
AD-713 128 HC$3.00 MF$0.65

USE OF Rn/Ra RATIOS TO DETERMINE AIR/SEA GAS EXCHANGE AND VERTICAL MIXING IN THE OCEAN.
Teledyne Isotopes Palo Alto Calif Palo Alto Labs
For primary bibliographic entry see Field 8C.
AD-713 129 HC$3.00 MF$0.65

SEPTEMBER CLIMATE OF SOUTHEAST ASIA.
Final climatological study.
Weather Wing (1st) Apo San Francisco 96553
Stanton R. Withrow. Aug 70, 68p Rept no. 1WW-Special Study-105-11/9
Supersedes Report dated Jul 66, AD-488 332.

Descriptors: (*Climatology, *Southeast Asia), Atmospheric temperature, Humidity, Wind, Marine meteorology, Thunderstorms, Cloud cover, Visibility, Ceiling, Atmospheric precipitation, Weather forecasting, Air Force operations, Vietnam, Laos, Cambodia, Thailand.
Identifiers: North Vietnam, South Vietnam, Monsoons.

The study is one of a revised series of publications dealing with the climate of Southeast Asia on a monthly basis. For the purpose of this study, Southeast Asia is defined as North Vietnam, Republic of Vietnam, Laos, Cambodia, and Thailand. (Author)
AD-713 132 HC$3.00 MF$0.65

SEA SURFACE WIND STRESS: THEORETICAL CALCULATIONS COMPARED WITH DIRECT MEASUREMENTS,
New York Univ Bronx Geophysical Sciences Lab
For primary bibliographic entry see Field 8C.
AD-713 167 HC$3.00 MF$0.65

LATIN AMERICAN FORECAST CENTER FORECASTERS' HANDBOOK.
Final rept.,
Weather Squadron (15th) Charleston AFB S C Detachment 3
Floyd F. Hauth. Oct 70, 70p

Descriptors: (*Weather forecasting, *Handbooks), (*Latin America, Weather forecasting), Atmospheric precipitation, Jet streams (Meteorology), Vortices, Surface temperatures, Marine meteorology, Meteorological satellites, Cloud cover, Fog, Convection (Atmospheric), Seacoast, Atmospheric temperature, Tropical regions, Air Force operations.
Identifiers: Spaceborne photography.

The handbook contains a summary of the geography and climatology of South America and adjacent oceans; analysis and forecasting procedures for extratropical; Southern Hemisphere, Systems, and tropical systems; jet stream analysis and its application forecasting; application of divergence and vorticity principles in analysis and forecasting; and, satellite mosaic interpretation. (Author)
AD-713 173 HC$3.00 MF$0.65

CLIMATOLOGICAL DATA FOR ANTARCTIC STATIONS. NUMBER 10, JANUARY 1967-DECEMBER 1968.
National Weather Records Center Asheville N C

May 70, 252p
Sponsored in part by Office of Naval Research, Washington, D. C. and National Science Foundation, Washington, D. C.

Descriptors: (*Climatology, *Antarctic Regions), Weather stations, Radiosondes, Wind, Atmospheric temperature, Ceiling, Visibility, Rainfall, Cloud cover, Barometric pressure, Snow, Tables.
Identifiers: Byrd Station (Antarctica), Amundsen-Scott Station (Antarctica), Plateau Station (Antarctica).

The publication summarizes available Antarctic meteorological observations for the period January 1967-December 1968. It was compiled at the National Weather Records Center, Asheville, North Carolina, in cooperation with the U. S. Weather Bureau. (Author)
AD-713 187 HC$3.00 MF$0.65

OBSERVATIONS OF RAIN AND HAIL GUSHES AFTER LIGHTNING,
Little (Arthur D) Inc Cambridge Mass
C. B. Moore, B. Vonnegut, E. A. Vrablik, and D. A. McCaig. 22 Apr 63, 31p
Contract Nonr-1684 (00)

Descriptors: (*Thunderstorms, Correlation techniques), (*Rainfall, Measurement), (*Hail, Measurement), Intensity, Meteorological radar, Clouds, Radar echo areas, Lightning, New Mexico.

Observations of thunderstorms in New Mexico were made with a vertically-scanning, 3 cm radar on a mountain-top. Prior to a lightning stroke the radar echo was usually quite weak indicating precipitation echoes of 5 mm/hr or less. Following the lightning stroke it was observed that in the region of the cloud where the stroke took place the radar echo intensity rapidly increased and a gush of rain or hail fell nearby. In some cases after the lightning stroke there were regions in the cloud where the low radar reflectivity decreased instead of increased. These measurements confirm earlier radar observations, made by the authors at Grand Bahama Island B.W.I., which showed that lightning strokes are often followed by the detection of a rapidly-intensifying echo and then by a gush of rain at the ground. The increases and decreases in radar reflectivity in small volumes of the cloud following lightning suggest that the electric discharge is influencing the nature of particles in the cloud. (Author)
AD-713 255 HC$3.00 MF$0.65

SOME RESULTS OF AN INVESTIGATION INTO THUNDERSTORM CHARGE GENERATION,
Little (Arthur D) Inc Cambridge Mass
B. Vonnegut, M. Brook, James Cook, and C. B. Moore. 22 Aug 56, 32p
Contract Nonr-1684 (00)

Descriptors: (*Cumulus clouds, Electric fields), (*Thunderstorms, Sources), Meteorological radar, Radar echo areas, Atmospheric precipitation, Raindrops, Convection (Atmospheric), Radiosondes, Balloons.
Identifiers: Graphs (Charts).

The purpose of the report is to determine whether electrification in growing cumulus clouds precedes initiation of precipitation as detectable by radar. The mechanisms taking place in the early stages of a forming thundercloud have received little attention in the past by students of thunderstorms. There appears to be no evidence reported in the literature to support the widely held premise that rain causes thunderstorm electrification. This experiment then should provide one rigid criterion for judging the acceptability of theories proposed. (Author)
AD-713 263 HC$3.00 MF$0.65

SUMMARY OF SYNOPTIC METEOROLOGICAL OBSERVATIONS: MEDITERRANEAN MARINE AREAS. VOLUME 6. AREA 20 - W. IONIAN SEA. AREA 21 - MALTA. AREA 22 - GULF OF SIDRA. AREA 23 - E. IONIAN SEA.
Naval Weather Service Command Washington D C

Oct 70, 641p
See also Volume 5, AD-713 648 and Volume 7, AD-713 084.

Descriptors: (*Marine meteorology, Seacoast), (*Meteorological parameters, Mediterranean Sea Islands), Weather forecasting, Atmospheric precipitation, Visibility, Wind, Snow, Hail, Fog, Cloud cover, Ocean waves, Thunderstorms, Lightning, Tables.
Identifiers: Air water interactions, Ionian Sea, Malta, Gulf of Sidra.

The data contained in these tables were obtained from tape data Family II (TDF-II), Marine Surface observations. TDF-II was primarily funded by the Naval Weather Service Command and selected by NWSED Asheville as the most comprehensive collection of marine surface observations from which to develop a series of coastal marine summaries. The area includes the East and West Ionian Sea, Malta, and the Gulf of Sidra. (Author)

AD-713 295 HC$10.00 MF$0.65

SOME FEATURES OF WIND WAVES IN LAKE MICHIGAN.
United States Lake Survey Detroit Mich
For primary bibliographic entry see Field 8H.
AD-713 329

MESOSCALE WEATHER SYSTEMS WITHIN AN OCCLUSION,
Air Force Cambridge Research Labs L G Hanscom Field Mass
Carl W. Kreitzberg, and H. Albert Brown. 29 Jan 70, 17p Rept no. AFCRL-70-0520
Revision of report dated 22 Oct 69.
Availability: Pub. in Jnl. of Applied Meteorology, v9 n3 p417-432 Jun 70.

Descriptors: (*Atmospheric precipitation, Cyclones), Radiosondes, Atmospheric sounding, Atmospheric motion, Intensity, Stability, Heat transfer.
Identifiers: Stormy Spring Project, Fronts (Meteorology).

Precipitation systems within a mature extratropical cyclone are related to the mesoscale thermal and circulation fields aloft using data from Project Stormy Spring conducted by the Air Force Cambridge Research Laboratories. Precipitation systems were analyzed using radars and recording raingages, including a special mesoscale array; upper-air structures were deduced from a 10-site mesoscale rawinsonde network including serial soundings at 90-min intervals. Results show that most of the widespread precipitation, in conjunction with the cyclonic-scale vertical motions in frontal baroclinic zones, occurs in bands and groups of showers. A sub-synoptic core of cold dry air in the middle troposphere ahead of the surface occlusion was found to be subsiding and surpressing widespread cloudiness, while it was furnishing a large amount of potential instability. The cyclone-scale ascending motions then released the potential instability around this cold core and also above the warm frontal stable layer. The convection became aligned in bands roughly parallel to the wind shear in the convective layer. These bands included clusters of cells of more intense precipitation. (Author)
AD-713 330

CASE STUDIES OF A CONVECTIVE PLUME AND A DUST DEVIL.
Interim rept.,
Air Force Cambridge Research Labs L G Hanscom Field Mass
J. C. Kaimal, and J. A. Businger. 13 Mar 70, 11p Rept no. AFCRL-70-0564
Revision of report dated 8 Jan 70.
Availability: Pub. in Jnl. of Applied Meteorology, v9 n4 p612-620 Aug 70.

Descriptors: (*Atmospheric motion, Micrometeorology), (*Dust storms, Kansas), Convection (Atmospheric), Wind, Stability, Atmospheric temperature, Anemometers, Rotation.
Identifiers: *Dust devils, Wind velocity.

The paper describes the characteristics of a convective plume and a dust devil from measurements made at 5.66 and 22.6 m above a flat uniform site in Kansas. The velocity fluctuations were measured with a continuous-wave, three-component sonic anemometer and the temperature fluctuations with a fine platinum wire thermometer. The data show that the plume is basically a nonrotating system; it is more tilted in the downwind direction than the dust devil, travels at a lower velocity than the mean wind speed at 0.5 m, and requires vertical stretching for its maintenance in the presence of wind shear. The dust devil shows a downdraft in the middle, travels at a higher velocity than the mean wind at 32 m, and derives much of its stability from rotation. Both systems tend to transport momentum upward, against the velocity gradient, which probably accounts for the very low and sometimes negative stresses observed during unstable conditions. (Author)
AD-713 365

ANOMALOUS MESOSPHERIC TEMPERATURES OBSERVED AT WHITE SANDS, NEW MEXICO,
Air Force Cambridge Research Labs L G Hanscom Field Mass
A. C. Faire, K. S. W. Champion, and S. P. Zimmerman. 1970, 11p Rept no. AFCRL-70-0558
Availability: Pub. in Space Research X - North-Holland Publishing Company, Amsterdam, p198-207 1970.

Descriptors: (*Mesosphere, Atmospheric temperature), (*Atmospheric temperature, New Mexico), Anomalies, Spheres, Atmospheric sounding, Falling bodies, Heat, Theory, Microbarometric waves.
Identifiers: White Sands (New Mexico), Temperature profiles, Internal gravity waves.

Temperature-height profiles from falling sphere measurements made at White Sands, New Mexico, during January 1967 exhibit unusually large variability, especially in the vicinity of the mesopause. Dramatic warming is observed near the 85 km level. This is accompanied by short time-interval shifts in the altitude of the minimum temperature resulting in the development of a double mesopause. A preliminary investigation of the data suggests that the temperature variations were related to a large-scale synoptic disturbance which was present at the time of the measurements. Spatial and temporal analysis of the data reveals a wave-like structure which increases in amplitude with increasing height above the Earth. Vertical half-wavelengths of the order of 3 and 30 km are observed with a characteristic period of 12 hours. From a comparison of meteorological data below 60 km and further analysis of the data in terms of appropriate theory, it is tentatively concluded that internal gravity waves may be the source of the anomalous temperatures observed. (Author)
AD-713 369

A NUMERICAL MODEL OF WARM FOG DISSIPATION BY HYGROSCOPIC PARTICLE SEEDING,
Air Force Cambridge Research Labs L G Hanscom Field Mass
Bernard A. Silverman, and Bruce A. Kunkel. 1 Apr 70, 8p Rept no. AFCRL-70-0559
Revision of report dated 12 Jan 70.
Availability: Pub. in Jnl. of Applied Meteorology, v9 n4 p627-633 Aug 70.

Descriptors: (*Fog, Removal), Sodium chloride, Mathematical models, Atmospheric condensation, Sedimentation, Visibility.
Identifiers: *Fog dispersal.

A numerical model has been developed which simulates the modification of warm fog caused by the condensation-coalescence growth of monodispersed hygroscopic particles introduced into the top of a fog layer. With this model, the effects of the quantity and size of NaCl particles on the visibility in fogs of various drop size spectra and liquid water contents were determined. The results show that the optimum seeding particle radius is approximately 10 micrometers. For fogs with a relatively high turbulence level where time is an important factor, particles >10 micrometers may be necessary. To achieve the same visibility improvement, the seeding rate is directly proportional to the fog liquid water content and inversely proportional to the fog drop size. Because of the large payloads and dispensing rates required, the results indicate that there is no advantage in using saturated solution droplets instead of dry particles. (Author)
AD-713 370

VORTEX SIGNATURE RECOGNITION BY A DOPPLER RADAR,
Air Force Cambridge Research Labs L G Hanscom Field Mass
Ralph J. Donaldson, Jr. 27 Apr 70, 11p Rept no. AFCRL-70-0565
Revision of report dated 20 Nov 69.
Availability: Pub. in Jnl. of Applied Meteorology, v9 n4 p661-670 Aug 70.

Descriptors: (*Thunderstorms, Vortices), (*Vortices, Spectrum signatures), Doppler radar, Radar echo areas, Atmospheric motion, Radar images, Display systems, Radar equipment, Rotation, Stresses.

A scanning Doppler radar has capability for measurement of the tangential shear of radial velocity or gradient of the radial component of velocity in a direction normal to the radial vector. Tangential shear of sufficient magnitude in a horizontal direction reveals one term of the expression for vorticity in a horizontal plane. A vortex is reasonably well identified by Doppler radar if the shear is sufficiently steady during the time required for half a revolution of a vortex, and is further confirmed by extension of the shear pattern throughout a depth greater than its diameter, and by invariance of the character of the shear with respect to a change in viewing angle. A vortex in solid rotation has a characteristically uniform signature on a Doppler velocity display which may, however, be smoothed down according to the resolution limitations of the antenna beam. Sharp velocity peaks are rounded down to roughly half the magnitude of the velocity interval encompassed within the half-power antenna beamwidth. An illustration of a persistent vortex at altitudes of 1-4 km in a severe thunderstorm revealed a solidly rotating core averaging 600 m in radius with vorticities as high as 0.06/sec, surrounded by a much larger area of considerably smaller vorticity. (Author)
AD-713 372

CLIMATE MODIFICATION AND NATIONAL SECURITY,
Rand Corp Santa Monica Calif
R. R. Rapp. Oct 70, 10p Rept no. P-4476
Presented at the Meteorological Technical Exchange Conference (1970), Annapolis, Md., 21-24 Sep 70.

Descriptors: (*Climatology, National defense), Mathematical models, Atmosphere models, Ocean models, Cloud cover, Boundary layer, Convection (Atmospheric), Harmonic analysis, Cumulus clouds.
Identifiers: *Weather modification.

The report discusses nine projects on the problems of climatic simulation. Included in the report are ocean models, atmospheric radiation, convective cloud models, numerical models, numerical weather prediction, and cumulus cloud models.
AD-713 428 HC$3.00 MF$0.65

PRELIMINARY DATA ON RADAR INDICATORS OF HAIL DANGER CENTERS IN THE GISSAR VALLEY,
Army Foreign Science and Technology Center Washington D C
T. V. Sevastyanova, and Kh. M. Makhmudov. 26 Jun 70, 9p Rept no. FSTC-HT-23-256-70
Trans. of mono. Temperaturnyi Rezhim i Analiz Frontov v Gorakh, Tashkent, 1967 p151-155.

Descriptors: (*Hail, Detection), Meteorological radar, Clouds, Probability, Radar echo areas, Rainfall, Moisture, Thickness, USSR.
Identifiers: Translations, Gissar Valley.

Being able to distinguish hail-producing from non-hail-producing clouds in order to determine the probability of modifications occurring in convective clouds, is very important. Radar detection appears to be a more effective method in comparison

to the synoptic method. In 1966, the Soviet Union made an attempt in the Gissar Valley to recognize the characteristics which would have permitted distinguishing radar reflections from hail producing and heavy rain producing clouds, as well as from clouds containing no precipitable moisture. Clouds were observed by using circular scanning and verticle profiles. From the profile data of the 197 observation centers the following radar characteristics of the clouds were found: magnitude of maximum reflectivity zm in decibels and its position in the cloud; thickness of the zone of increased reflectivity, its position in the cloud; the altitude of these zones and their temperature characteristics; the magnitude of radar reflectivity. (Author)
AD-713 468 HC$3.00 MF$0.65

LABORATORY INVESTIGATIONS ON AIR-SEA INTERACTIONS.
Stanford Univ Calif Dept of Civil Engineering
For primary bibliographic entry see Field 8C.
AD-713 469 HC$3.00 MF$0.65

ENVIRONMENTAL DATA FROM AN/SMT-1 NOMAD N3S GULF OF MEXICO: PROJECT SEA SENSE.
Progress rept.,
National Oceanographic Data Center Washington D C
S. J. Halminski, K. R. Avery, and D. LaMar. Sep 70, 178p Rept no. NODC-Pub-P-97

Descriptors: (*Marine meteorology, *Mexico Gulf), (*Weather stations, Oceanographic data), Atmospheric temperature, Sea water, Temperature, Wind, Barometric pressure, Tables, Buoys.
Identifiers: *Sea Sense Project, NOMAD (Navy Oceanographic Meteorological Automatic Devices), Navy oceanographic meteorological automatic devices, AN/SMT-1.

The purpose of the report is to display, in climatic form, environmental data collected from one of many Navy operated unmanned marine automatic buoys, the AN/SMT-1 NOMAD (Navy Oceanographic Meteorological Automatic Device) N3S. During 1968, NOMAD N3S was located in the Central Gulf of Mexico at 25.1 degrees N. and 89.9 degrees W, where the water depth is approximately 11,000 feet. (Author)
AD-713 479 HC$3.00 MF$0.65

COOPERATIVE INVESTIGATION OF THE CARIBBEAN AND ADJACENT REGIONS (CICAR). BIBLIOGRAPHY ON METEOROLOGY, CLIMATOLOGY, AND PHYSICAL/CHEMICAL OCEANOGRAPHY. VOLUME I.
American Meteorological Society Washington D C

1970, 391P
See also Volume 1 Indexes, AD-713 493.
Availability: Paper copy available from U. S. Naval Oceanographic Office, Washington, D. C. 20390. $7.00.

Descriptors: (*Marine meteorology, Caribbean Sea), (*Oceanology, *Bibliographies), Abstracts, Tropical cyclones, Heat transfer, Rainfall, Storms, Snow, Tornadoes, Upper atmosphere, Atmospheric temperature, Ocean waves, Sea water, Chemical properties, West Indies, Mexico Gulf.

The abstracted bibliography has been compiled from the files of the Meteorological and Geoastrophysical Abstracts Office of the American Meteorological Society (AMS) and from files of Government libraries in the Washington, D.C., area. Its purpose is to provide the participants of CICAR with a reasonably comprehensive and timely review of the published literature in physical/chemical oceanography and in meteorology/climatology concerned with the Caribbean Sea, Gulf of Mexico, Greater and Lesser Antilles Regions, and the adjacent coastal areas of North, Central, and South America. Articles dealing with weather phenomena outside of this geographical region, but influencing the atmosphere within the area, have been included occasionally. Similarly, references to oceanographic region, but influencing the atmosphere within the area, have been included occasionally. Similarly, references to oceanographic cruise data taken outside of but close to this area were also sometimes included. (Author)
AD-713 492 MF$0.65

COOPERATIVE INVESTIGATION OF THE CARIBBEAN AND ADJACENT REGIONS (CICAR). BIBLIOGRAPHY OF METEOROLOGY, CLIMATOLOGY, AND PHYSICAL/CHEMICAL OCEANOGRAPHY. VOLUME I INDEXES.
American Meteorological Society Washington D C
1970, 244P
See also Volume 1, AD-713 492.
Availability: Paper copy available from U. S. Naval Oceanographic Office, Washington, D. C. 20390. $6.00.

Descriptors: (*Marine meteorology, Caribbean Sea), (*Oceanology, *Bibliographies), Indexes, Tropical cyclones, Humidity, Sea breeze, Radiosondes, Wind, Tornadoes, Hurricane tracking, Ocean currents, Atmospheric temperature, Chemical properties, West Indies, Mexico Gulf.

The report includes a subject index on meteorology; a meteorological geographical index; a oceanography subject index; a oceanography geographical index; and an author index, compiled from data from the U. S. National Oceanographic Center on the Caribbean Sea and adjacent regions.
AD-713 493 MF$0.65

THE CHARACTERISTIC COEFFICIENTS TECHNIQUE FOR PROBABILITY MODELS OF WIND PROFILES IN MISSILE DESIGN AND ENVIRONMENT ANALYSIS,
Army Missile Command Redstone Arsenal Ala Physical Sciences Lab
O. Essenwanger. 1970, 16p

Descriptors: (*Wind, Mathematical models), (*Guided missiles, Design), (*Guided missile trajectories, Impact prediction), Mathematical prediction, Monte Carlo method, Costs.
Identifiers: Wind profiles, Wind velocity, Computer aided analysis.

Three forms to describe global conditions for computer analysis of the wind influence upon missile systems have been common in the past: Individual wind profiles, intra and inter-level correlation matrices, and synthetic wind profile. All three methods show one or several kinds of deficiency: Voluminous data input, data bias, unrealistic vertical relationship, complex and costly computation, or difficulty in associating probability. The above problems can be solved by the characteristic coefficient technique. The individual wind profile is described by a number of characteristic coefficients with subsequent reduction to one variable only. Three equations and a set of constants express completely the variety of global wind conditions and association with any wind probability threshold. Based upon the above tool sets of global wind models can be derived. The geographic and seasonal variation of a system of nine model groups is discussed and proves to be rational. (Author)
AD-713 522 HC$3.00 MF$0.65

A MORE RIGOROUS EXPRESSION FOR THE RATE OF DROPLET GROWTH,
Atmospheric Sciences Lab White Sands Missile Range N Mex
Richard D. H. Low. 1970, 13p

Descriptors: (*Artificial precipitation, Mathematical analysis), (*Water vapor, Condensation), Nucleation, Vapors, Diffusion, Integration.
Identifiers: Weather modification.

One facet of weather modification is the dissipation of a warm fog or the improvement of visibility within it by means of seeding with condensation nuclei. The analysis of the effectiveness of this type of nuclei finds its roots in the mathematical expression for condensational growth - one of the few fundamental equations in cloud physics which has, only during the past twenty years, been recognized as a distinct branch of physical meteorology and, more recently, as an integral part of atmospheric physics. Being a young science, cloud physics has embodied areas of study which are in need of better understanding and further development, one such area being the processes of condensation and precipitation. The fundamental equation is applicable to the growth of an isolated and immobile saturated solution droplet in a stationary medium of moist air. It is the purpose of this paper to examine this equation critically from a theoretical point of view. (Author)
AD-713 559 HC$3.00 MF$0.65

A SUMMARY OF AIRLINE WEATHER-RADAR OPERATIONAL POLICIES AND PROCEDURES.
Technical rept.,
Air Weather Service Scott AFB Ill
Paul W. Kadlec. Sep 70, 21p Rept no. AWS-TR-238

Descriptors: (*Civil aviation, Weather forecasting), (*Meteorological radar, Operation), Takeoff, Landings, Thunderstorms, Tornadoe , Reviews, Aviation safety.
Identifiers: AN/APS-10.

The report discusses and summarizes the Weather-Radar operational policies and procedures of eleven US commercial airlines. (Author)
AD-713 636 HC$3.00 MF$0.65

SUMMARY OF SYNOPTIC METEOROLOGICAL OBSERVATIONS: MEDITERRANEAN MARINE AREAS. VOLUME 5. AREA 16 - S. W. SICILY. AREA 17 - TRIPOLI. AREA 18 - N. ADRIATIC SEA. AREA 19 - S. ADRIATIC SEA.
Naval Weather Service Command Washington D C

Oct 70, 641p
See also Volume 4, AD-713 780 and Volume 6, AD-713 295.

Descriptors: (*Marine meteorology, Seacoast), (*Meteorological parameters, Mediterranean Sea), Atmospheric temperature, Atmospheric precipitation, Wind, Hail, Fog, Haze, Ceiling, Visibility, Cloud cover, Ocean waves, Tables, Adriatic Sea, Sicily.
Identifiers: Tripoli.

The data contained in these tables were obtained from tape data Family 11 (TDF-11), Marine Surface observations. TDF-11 was primarily funded by the Naval Weather Service Command and selected by NWSED Asheville as the most comprehensive collection of marine surface observations from which to develop a series of coastal marine summaries. The areas discussed in this document include Sicily, Tripoli, and the Adriatic Sea. (Author)
AD-713 648 HC$10.00 MF$0.65

A COMPARISON OF THE WARM FOG CLEARING CAPABILITIES OF SOME HYGROSCOPIC MATERIALS,
Air Force Cambridge Research Labs L G Hanscom Field Mass
Bruce A. Kunkel, and Bernard A. Silverman. 12 Jan 70, 7p Rept no. AFCRL-70-0560

Availability: Pub. in Jnl. of Applied Meteorology, v9 n4 p634-638 Aug 70.

Descriptors: (*Fog, Removal), Hydroxides, Chlorides, Nucleation, Ammonium compounds, Nitrates, Urea, Artificial precipitation.
Identifiers: *Fog dispersal, Cloud seeding, Ammonium nitrate.

The chemical properties of hygroscopic materials are evaluated to determine the desirable characteristics of an effective warm fog seeding agent. A numerical model is used to determine the relative fog clearing capabilities of the potentially effective chemicals. In general, the results show that the hydroxides and chlorides, when dispensed as dry material, are most effective, while high solubility materials, such as NH4NO3, are most effective when dispensed as saturated solution droplets. Many of the more effective materials are either corrosive or caustic and therefore not practical seeding agents. Of all the chemicals examined, urea and ammonium nitrate are the most practical materials as they are neither corrosive nor caustic and are relatively inexpensive. (Author)
AD-713 666

AN INVESTIGATION OF THE INFLUENCE OF WATER WAVES ON THE ADJACENT AIRFLOW.
Doctoral thesis,
Michigan Univ Ann Arbor Dept of Mathematics
Kenneth Laverne Davidson, and Donald J. Portman. Aug 70, 278p Rept no. 08849-2-T
Contract N00014-67-A-0181-0005

Descriptors: (*Wind, Lake waves), (*Great Lakes, Turbulent boundary layer), Transport properties, Momentum, Temperature, Power spectra, Theses, Data processing systems.
Identifiers: Air water interactions, Lake Michigan, Spectrum analysis.

An observational study was made during August, September and October 1968 to investigate the influence of water waves on the adjacent airflow. Simultaneous measurements of wind and temperature fluctuations and waves were made from a tower on Lake Michigan. 11 periods were analyzed, and 8 included simultaneous measurements of velocity and temperature fluctuations at two levels above the mean water level. Hot-wire anemometers with X-probe sensors were used to obtain both the along-wind and vertical components of the fluctuating wind. High response resistance wires were used to measure temperature fluctuations and a capacitance gauge was used to measure the waves. Data were analyzed to obtain variance and covariance spectra over a frequency range from .01 to 15 Hz and are presented over a range from .03 to 10 Hz. (Author)
AD-713 694 HC$3.00 MF$0.65

APPLICATION OF THE METHOD OF CANONICAL CORRELATIONS IN METEOROLOGY,
Foreign Technology Div Wright-Patterson AFB Ohio
L. S. Gandin. 3 Sep 70, 33p Rept no. FTD-MT-24-150-70
Edited machine trans. of Glavnaya Geofizicheskaya Observatoriya, Leningrad. Trudy (USSR) n208 p5-22 1967, by Charles T. Ostertag.

Descriptors: (*Weather forecasting, Correlation techniques), Regression analysis, Set theory, Statistical processes, USSR.
Identifiers: Translation.

Application of canonic correlations to problems in meteorology and specifically to forecasting characteristics of meteorological fields is discussed. In meteorological terms, the problem of canonic correlation can be formulated as follows: find a linear combination of predictors and of predicants that will have an optimally close statistical relationship among each other. Algorithms and covariational (or correlational) matrices are constructed. To improve the accuracy of the input matrices (or assumption matrices), two alternate methods are suggested: (1) covariation (or correction) functions are plotted as a preliminary measure, i.e., an autocovariation function for two variables and a cross-covariation function to link these variables; (2) random errors in measurement of the variables are calculated. A specimen calculation of a long-range forecast of the relationships between the average monthly surface water temperature in the North Atlantic in November and the average monthly air temperature over the European part of the SSSR in December is included.
AD-713 774 HC$3.00 MF$0.65

HYDROMETEOROLOGICAL SCIENTIFIC RESEARCH CENTER OF THE USSR. TRANSACTIONS. NUMBER 15, 1967 (SELECTED ARTICLES),
Foreign Technology Div Wright-Patterson AFB Ohio
E. N. Blinova, A. K. Popov, and S. I. Rudenko. 31 Aug 70, 86p Rept no. FTD-MT-24-170-70
Edited machine trans. of Gidrometeorologicheskii Nauchno-Issledovatelskii Tsentr SSSR. Trudy, n15 p3-47 1967, by Charles T. Ostertag.

Descriptors: (*Weather forecasting, *Atmospheric motion), Hydrodynamics, Troposphere, Stratosphere, Thermal conductivity, Heat transfer, Fourier analysis, USSR.
Identifiers: Translation, Geopotential.

Contents: General circulation of the atmosphere and hydrodynamic long-term forecasting of weather; Generalization of the hydrodynamic theory of climate and long-term weather forecasting; Experiments with a four-level scheme of forecasting the geopotential in the troposphere and lower stratosphere taking into account radiation and turbulent thermal conductivity
AD-713 775 HC$3.00 MF$0.65

WORLD METEOROLOGICAL CENTER. TRANSACTIONS. NUMBER 14, 1966 (SELECTED ARTICLES),
Foreign Technology Div Wright-Patterson AFB Ohio
S. A. Bortnikov, V. M. Kadyshnikov, N. I. Buleyev, V. V. Knyah, and L. V. Berkovich. 18 Sep 70, 63p Rept no. FTD-MT-24-173-70
Edited machine trans. of Mirovoi Meteorologicheskii Tsentr, Moscow. Trudy (USSR) n14 p10-22, 48-58, 92-101 1966, by K. L. Dion.

Descriptors: (*Weather forecasting, Mathematical prediction), Hydrodynamics, Mathematical models, Wind, Velocity, Thermal conductivity, USSR.
Identifiers: Translations, Geopotential.

Contents: Some results of operative short-range forecasting of the geopotential based on complete equations for two atmospheric levels; Experiment in forecasting on the basis of a three-level hydrodynamic model; Numerical solution of hydromechanics equations for atmospheric motions; A three-level scheme for forecasting meteorological elements based on complete equations.
AD-713 777 HC$3.00 MF$0.65

SUMMARY OF SYNOPTIC METEOROLOGICAL OBSERVATIONS: MEDITERRANEAN MARINE AREAS. VOLUME 3. AREA 8 - N. MENORCA. AREA 9 - MALLORCA. AREA 10 - ALGIERS. AREA 11 - CORSICA.
Naval Weather Service Command Washington D C

Oct 70, 642p
See also Volume 4, AD-713 780.

Descriptors: (*Marine meteorology, Seacoast), (*Meteorological parameters, *Mediterranean Sea), Atmospheric temperature, Atmospheric precipitation, Wind, Hail, Fog, Haze, Ceiling, Visibility, Cloud cover, Ocean waves, Velocity, Tables, Algeria.
Identifiers: Corsica, Menorca, Mallorca.

The data contained in these tables were obtained from tape data Family 11 (TDF-11), Marine Surface observations. TDF-11 was primarily funded by the Naval Weather Service Command and selected by NWSED Asheville as the most comprehensive collection of marine surface observations from which to develop a series of coastal marine summaries. The areas included are Menorca, Mallorca, Algiers and Corsica.
AD-713 779 HC$10.00 MF$0.65

SUMMARY OF SYNOPTIC METEOROLOGICAL OBSERVATIONS: MEDITERRANEAN MARINE AREAS. VOLUME 4. AREA 12 SARDINIA. AREA 13 - ANNABA. AREA 14 - ROME. AREA 15 - S. TYRRHENIAN SEA.
Naval Weather Service Command Washington D C

Oct 70, 641p
See also Volume 3, AD-713 779 and Volume 5, AD-713 648.

Descriptors: (*Marine meteorology, Seacoast), (*Meteorological parameters, *Mediterranean Sea), Atmospheric temperature, Atmospheric precipitation, Wind, Hail, Snow, Fog, Haze, Ceiling, Visibility, Cloud cover, Ocean waves, Velocity, Tables, Sardinia.
Identifiers: Anaba, Rome (Italy), Tyrrhenian Sea.

The data contained in these tables were obtained from tape data Family 11 (TDF-11), Marine Surface observations. TDF-11 was primarily funded by the Naval Weather Service Command and selected by NWSED Asheville as the most comprehensive collection of marine surface observations from which to develop a series of coastal marine summaries. The areas discussed in this report include Sardinia, Annaba, Rome and the Tyrrhenian Sea. (Author)
AD-713 780 HC$10.00 MF$0.65

TRANSACTIONS OF THE LENINGRAD INSTITUTE OF APPLIED GEOPHYSICS,
Foreign Technology Div Wright-Patterson AFB Ohio
N. L. Byzova, V. L. Klinov, O. A. Volkovitskii, and V. I. Ignatenko. 14 Sep 70, 54p Rept no. FTD-HC-23-14-69
Edited trans. from Institut Prikladnoi Geofiziki, Leningrad. Trudy (USSR) p18-38, 67-74 1967.

Descriptors: (*Atmosphere, Boundary layer), (*Fog, *Weather forecasting), (*Wind, Velocity), Temperature inversion, Clouds, Towers, Reports, Solar eclipses, USSR.
Identifiers: Translations, Wind velocity.

Contents: Two cases of a change in the meteorological parameters in the lower atmospheric layer; Certain features of the meteorological regime of the lower atmospheric layer in the case of low clouds and fog; Wind velocity field near the Ostankin.
AD-713 785 HC$3.00 MF$0.65

SELECTION OF AGROCLIMATOLOGICAL DATA.
Recueil de Donnees Agroclimatologiques
France. Direction de La Meteorologie Nationale, Paris.
P. Brochet, and N. Gerbier. May 70, 85p
Lang- in French Seri- Its Monographie No. 75

Descriptors: *Agriculture, *Climatology, *France, *Meteorological charts, *Tables (data), Evaporation, Mathematical models, Solar radiation, Transpiration, Water loss.

For abstract, see STAR 08 21.
N70-38298 HC$3.00 MF$0.65

CLIMATOLOGY OF THE TONTOUTA AIRFIELD.
Climatologie de l'Aerodrome de La Tontouta France. Direction de La Meteorologie Nationale, Paris.
D. Rignot, and M. T. Tanguy. May 70, 63p
Lang- in French Seri- Its Monographie No. 74

Descriptors: *Airports, *Climatology, *Pacific islands, *Tables (data), Ceilings (meteorology), Cloud cover, Nomographs, Precipitation (meteorology), Solar wind, Temperature, Visibility, Wind (meteorology).

For abstract, see STAR 08 21.
N70-38299 HC$3.00 MF$0.65

EXAMPLES OF THE USEFULNESS OF SATELLITE DATA IN GENERAL ATMOSPHERIC CIRCULATION RESEARCH. PART 1 - MONTHLY GLOBAL ATMOSPHERIC CIRCULATION CHARACTERISTICS AS REFLECTED IN TIROS 7 RADIOMETRIC MEASUREMENTS.
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
L. J. Allison, F. A. Godshall, E. R. Kreins, and G. Warnecke. Dec 69, 116p NASA-TN-D-5630, G-959
Contract 160-44-03-02-51

Descriptors: *Atmospheric circulation, *Climatology, *Radiometers, *Tiros 7 satellite, Bibliographies, Black body radiation, Cloud cover, Earth (planet), Maps.

For abstract, see STAR 08 21.
N70-38615 HC$3.00 MF$0.65

OASES IN ANTARCTICA.
Oazisy V Antarktide
Israel Program for Scientific Translations, Ltd., Jerusalem.
A. V. Solopov. 1969, 150p TT-6850490
Tran- Transl. Into English From Meteorol.- Sbornik Statei (USSR), No. 14, 1967 P 1-143 Prep- Prepared for Nsf Seri- Its Meteorology No. 14

Descriptors: *Antarctic regions, *Climatology, *Hydrogeology, Atmospheric circulation, Geography, Glaciers, Land ice, Meteorological parameters, Precipitation (meteorology), Temperature profiles.

For abstract, see STAR 08 21.
N70-38624 HC$3.00 MF$0.65

METEOROLOGICAL DATA OF THE MILOC-BALTIC 1967 CRUISE.
Saclant ASW Research Center, La Spezia (Italy).
R. Pesaresi. 15 Oct 68, 51p SACLANTCEN-TR-125

Descriptors: *Baltic sea, *Heat flux, *Solar radiation, Atmospheric temperature, Ocean surface, Vapor pressure, Vertical distribution, Wind profiles.

For abstract, see STAR 08 21.
N70-38738 HC$3.00 MF$0.65

PRECIPITATION SCAVENGING IN A LARGE-CLOUD DIFFUSION CODE,
California Univ., Livermore. Lawrence Radiation Lab.
For primary bibliographic entry see Field 18H.
For abstract, see NSA 24 20.
UCRL-72603 HC$3.00 MF$0.65

5. BEHAVIORAL AND SOCIAL SCIENCES

5A. Administration and Management

DEADLOCK-FREE SHARING OF RESOURCES IN ASYNCHRONOUS SYSTEMS.
Massachusetts Inst of Tech Cambridge Dept of Electrical Engineering
For primary bibliographic entry see Field 12B.
AD-713 139 HC$3.00 MF$0.65

AN EMPIRICAL STUDY OF A MODEL AND STRATEGIES FOR PLANNED ORGANIZATIONAL CHANGE.
Michigan Univ Ann Arbor Inst for Social Research
For primary bibliographic entry see Field 5K.
AD-713 231 HC$3.00 MF$0.65

A SERIES OF STUDIES ON THE DESIGN REQUIREMENTS FOR A REAL-TIME INFORMATION AND COMPUTATIONAL SYSTEM TO ASSIST R AND D MANAGEMENT IN THEIR PROJECT SELECTION DECISION-MAKING.
Final rept. 1965-1970,
Northwestern Univ Evanston Ill Dept of Industrial Engineering and Management Sciences
Albert H. Rubenstein, Norman R. Baker, R. Patrick Forster, Arthur P. Hurter, Jr., and Daniel L. Kegan. Jul 70, 15p Rept no. 70-33
Contract Nonr-1228 (38)

Descriptors: (*Research program administration, Management planning), (*Decision making, Mathematical models), Standards, Factor analysis, Programming (Computers), Real time, Reviews, Selection, Data processing systems, Information retrieval.
Identifiers: Research and development, Information systems, Computer analysis, Evaluation.

The paper reports on a series currently underway which are part of a long term project aimed at specifying the design requirements for a real-time, computer-aided, information system for the selection, review and evaluation of research and development (R and D) projects. Specifically the report focuses on phases of the research which have been supported by the Office of Naval Research. (Author)
AD-713 244 HC$3.00 MF$0.65

IMPACT OF PACIFICATION ON INSURGENCY IN SOUTH VIETNAM,
Rand Corp Santa Monica Calif
For primary bibliographic entry see Field 5D.
AD-713 430

USE OF MAGNETIC TAPE FOR REPORTING COST INFORMATION,
Rand Corp Santa Monica Calif
Joseph String, Jr. Sep 70, 53p Rept no. RM-6313-PR
Contract F44620-67-C-0045

Descriptors: (*Management planning, Cost effectiveness), (*Data processing systems, Magnetic tape), Information retrieval, Contracts, Procurement, Costs.
Identifiers: Accounting, Data acquisition, Cost analysis.

As an alternative to the current practice of submitting cost reports on paper, this study suggests incorporating the capabilities of electronic data processing in the design of reporting systems and using magnetic tape as the primary medium for reporting and storing data. Instead of submitting printed reports, a contractor would provide documentation of his accounting system and work assignment structure at the initiation of a procurement program, and provide periodic tape copies of his internal accounting records during the acquisition phase. A sample program was selected as a test case and all major tasks were performed, including in-depth reviews of the contractor's accounting system and the procurement program's work breakdown structure. A series of specialized paper reports were printed using a generalized report-generating program written for the project. No problems were encountered that could be attributed to the basic concepts of the system or to the principal elements of implementation. (Author)
AD-713 606 HC$3.00 MF$0.65

DEVELOPING CORPORATE STRATEGY THROUGH PLANNING, PROGRAMMING, AND BUDGETING,
Rand Corp Santa Monica Calif
L. A. Dougharty. Oct 70, 17p Rept no. P-4451

Descriptors: (*Organizations, Management planning), (*Industrial relations, Effectiveness), Decision making, Budgets, Mathematical models, Factor analysis, Substitutes.
Identifiers: *Planning programming and budgeting, Corporations.

The corporation needs a planning framework that aids in clarifying objectives, identifying the alternatives open to the firm, and measuring the effectiveness of those alternatives toward the attainment of the objectives of the corporation. To examine how PPB can be of use in the development of corporate strategy, it is necessary to review its most important features. One such review is presented. The concepts of PPB are then applied in the construction of a planning framework for a corporation. (Author)
AD-713 834 HC$3.00 MF$0.65

TECHNOLOGICAL FORECASTING,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
S. R. Fields. 26 Jun 70, 68p*
Contract AT (45-1)-1830

Descriptors: (*Forecasting, *Management planning), Relevance.
Identifiers: *Technological forecasting.

For abstract, see NSA 24 20.
BNWL-1466 HC$3.00 MF$0.65

RELATIONSHIPS BETWEEN RESEARCH AND DEVELOPMENT OPERATIONS AND INDUSTRIAL OPERATIONS AT MSFC.
Syracuse Univ., N. Y.
B. D. Wood. 1969, 27p NASA-CR-109153
Contract NGL-33-022-090
Conf- Presented At An Interdisciplinary Seminar, Syracuse, N. Y., 16 Apr. 1969 Seri- Its Working Paper No. 19

Descriptors: *Industrial management, *Management planning, *Project management, *Research and development, Nasa programs.

For abstract, see STAR 08 21.
N70-38714 HC$3.00 MF$0.65

A STOCHASTIC INVESTMENT MODEL FOR A SURVIVAL CONSCIOUS FISHING FIRM.
Final technical rept.,
Texas A and M Univ., College Station. Inst. of Statistics.
Russell G. Thompson, Richard W. Callen, and Lawrence C. Wolken. Jul 70, 29p TAMU-SG-70-218
Grant NSF-GH-59
Report on Sea Grant Program.

Descriptors: (*Fishing, *Shrimps), (*Investments, Decision making), (*Organizations, Survival), Mathematical models, Stochastic processes,

Problem solving, Analysis of variance, Prices, Econometrics.
Identifiers: *Shrimp fishing, Investment models, Economic survival models, Management information systems.

The purpose of the study was to develop further mathematical aids for investment-financial decision making in shrimp fishing. The model developed allows for random prices and catches per vessel and, in addition, takes into account all of the information known to the decision maker at each time of decision. Survival of the fishing firm is regarded as a fundamental factor influencing the firm's investment decision. (Author)
PB-194 905 HC$3.00 MF$0.65

HOUSING MONITORING SYSTEM.
Department of Metropolitan Development, Indianapolis. Div. of Planning and Zoning.
For primary bibliographic entry see Field 5K.
PB-194 930 HC$3.00 MF$0.65

STRUCTURAL AND ENVIRONMENTAL CONDITION SURVEY, AND ENVIRONMENTAL IMPROVEMENTS WORKLOADS,
Department of Metropolitan Development, Indianapolis. Div. of Planning and Zoning.
For primary bibliographic entry see Field 13B.
PB-194 931 HC$3.00 MF$0.65

THE SCRIP SYSTEM OF THE D.C. TRANSIT SYSTEM, WASHINGTON, D.C.
Washington Metropolitan Area Transit Commission, D.C.
For primary bibliographic entry see Field 13F.
PB-194 958 HC$3.00 MF$0.65

NATIONAL TRANSPORTATION PLANNING MANUAL (1970-1990). MANUAL A: GENERAL INSTRUCTIONS.
Department of Transportation, Washington, D.C.
For primary bibliographic entry see Field 15E.
PB-194 964 HC$3.00 MF$0.65

A PROGRAM OF TECHNICAL ASSISTANCE TO INDUSTRY IN TWENTY-SIX MISSISSIPPI COUNTIES AND THE CHOCTAW INDIAN RESERVATION, 1969-70.
Mississippi Research and Development Center, Jackson. Management and Technical Services Div.
For primary bibliographic entry see Field 5C.
PB-195 018 HC$3.00 MF$0.65

PREPARATION AND EXECUTION OF SEMINARS EXPLAINING USE AND IMPLEMENTATION OF MODEL MANAGEMENT INFORMATION SYSTEM FOR INSTITUTIONS OF HIGHER EDUCATION,
Ozarks Regional Commission.
For primary bibliographic entry see Field 5C.
PB-195 020 HC$3.00 MF$0.65

NEW YORK STATE APPALACHIAN RESOURCE STUDIES: RECREATION AND CULTURE. PHASE I: INVENTORY.
New York State Office of Planning Coordination, Albany.
For primary bibliographic entry see Field 5K.
PB-195 023 HC$3.00 MF$0.65

NEW YORK STATE APPALACHIAN RESOURCE STUDIES: TRANSPORTATION. PHASE I. INVENTORY.
New York State Office of Planning Coordination, Albany.
For primary bibliographic entry see Field 15E.
PB-195 024 HC$3.00 MF$0.65

URBAN DESIGN WITHIN THE COMPREHENSIVE PLANNING PROCESS,
Washington Univ., Seattle.
For primary bibliographic entry see Field 13B.
PB-195 031 HC$3.00 MF$0.65

HUMAN RESOURCES MANAGEMENT SYSTEM AND PROGRAM INITIATION. MANUAL A-MODEL 1.1.
Ozarks Regional Commission.
For primary bibliographic entry see Field 5I.
PB-195 033 HC$3.00 MF$0.65

HUMAN RESOURCES MANAGEMENT SYSTEM. COMMUNITY EVALUATION MODEL. MANUAL B-MODEL 1.2.
Ozarks Regional Commission.
For primary bibliographic entry see Field 5I.
PB-195 034 HC$3.00 MF$0.65

HUMAN RESOURCES MANAGEMENT SYSTEM. LABOR AVAILABILITY SURVEY. JOB AVAILABILITY SURVEY. LABOR/JOB MATCHING. MANUAL C-MODELS 1.3, 1.4, 1.5.
Ozarks Regional Commission.
For primary bibliographic entry see Field 5I.
PB-195 035 HC$3.00 MF$0.65

HUMAN RESOURCES MANAGEMENT SYSTEM. OCCUPATIONAL EDUCATION MODEL. MANUAL D, MODEL 1.6.
Ozarks Regional Commission.
For primary bibliographic entry see Field 5I.
PB-195 036 HC$3.00 MF$0.65

HUMAN RESOURCES MANAGEMENT SYSTEM. PROJECT EVALUATION. MANUAL E, MODEL 1.7.
Ozarks Regional Commission.
For primary bibliographic entry see Field 5I.
PB-195 037 HC$3.00 MF$0.65

HUMAN RESOURCES MANAGEMENT SYSTEM. PROJECT FINAL REPORT. MANUAL F.
Ozarks Regional Commission.
For primary bibliographic entry see Field 5I.
PB-195 038 HC$3.00 MF$0.65

FUTURE DEMANDS ON THE PUBLIC LANDS. VOLUME I: POLICY IMPACTS OF FUTURE DEMANDS,
Public Land Law Review Commission, Washington, D.C.
For primary bibliographic entry see Field 5C.
PB-195 041 HC$3.00 MF$0.65

FUTURE DEMANDS ON THE PUBLIC LANDS. VOLUME II: PROJECTIONS OF THE CONSUMPTION OF COMMODITIES PRODUCIBLE ON THE PUBLIC LANDS OF THE UNITED STATES 1980-2000.
Public Land Law Review Commission, Washington, D.C.
For primary bibliographic entry see Field 5C.
PB-195 042 HC$3.00 MF$0.65

FUTURE DEMANDS ON THE PUBLIC LANDS. VOLUME III: PROBABLE FUTURE DEMANDS ON PUBLIC LANDS,
Public Land Law Review Commission, Washington, D.C.
For primary bibliographic entry see Field 5C.
PB-195 043 HC$3.00 MF$0.65

FUTURE DEMANDS ON THE PUBLIC LANDS. VOLUME IV. PROBABLE FUTURE DEMANDS ON THE PUBLIC LANDS FOR NEW CITIES AND URBAN EXPANSION,
Public Land Law Review Commission, Washington, D.C.
For primary bibliographic entry see Field 5C.
PB-195 044 HC$3.00 MF$0.65

FINAL REPORT OF LOS ANGELES ASSOCIATION OF GENERAL SUB AND SPECIALTY CONTRACTORS,
Los Angeles Association of General, Sub and Specialty Contractors, Calif.
For primary bibliographic entry see Field 5C.
PB-195 051 HC$3.00 MF$0.65

COMMUNITY ACTION PROGRAM FOR TRAFFIC SAFETY. GUIDE I: RESPONSIBILITIES OF LOCAL OFFICIALS,
National Association of Counties Research Foundation, Washington, D.C.
For primary bibliographic entry see Field 13F.
PB-195 055 HC$3.00 MF$0.65

ECONOMIC DEVELOPMENT CENTER.
PACT Inc., San Francisco, Calif.
For primary bibliographic entry see Field 5C.
PB-195 077 HC$3.00 MF$0.65

TEXAS MARINE RESOURCES. A SUMMARY OF COASTAL ACTIVITIES.
Texas Engineering Experiment Station, College Station. Industrial Economics Research Div.
For primary bibliographic entry see Field 5C.
PB-195 078 HC$3.00 MF$0.65

TEXAS MARINE RESOURCES: THE LEGAL-ADMINISTRATIVE VIEW.
Texas A and M Univ., College Station.
For primary bibliographic entry see Field 5C.
PB-195 079 HC$3.00 MF$0.54

TEXAS MARINE RESOURCES: THE PORTS AND WATERWAYS VIEW.
Texas Engineering Experiment Station, College Station. Industrial Economics Research Div.
For primary bibliographic entry see Field 5C.
PB-195 090 HC$3.00 MF$0.65

A COMPUTER SIMULATION MODEL FOR EVALUATION OF THE HEALTH CARE DELIVERY SYSTEM.
Geomet, Inc., Rockville, Md.
For primary bibliographic entry see Field 6E.
PB-195 132 HC$3.00 MF$0.65

ARKANSAS' PRELIMINARY PLAN FOR ECONOMIC DEVELOPMENT IN THE OZARKS. 1970 SUPPLEMENT.
Ozarks Regional Commission.
For primary bibliographic entry see Field 5C.
PB-195 139 HC$3.00 MF$0.65

ACCEPTANCE OF DECENTRALIZATION IN THE PENNSYLVANIA HEALTH DEPARTMENT.
Pennsylvania State Univ., University Park. Dept. of Sociology.
For primary bibliographic entry see Field 6L.
PB-195 148 HC$3.00 MF$0.65

TEXAS MARINE RESOURCES. THE INDUSTRIAL VIEW.
Texas A and M Univ., College Station.
For primary bibliographic entry see Field 5C.
PB-195 152 HC$3.00 MF$0.65

HURRICANE CELIA REDEVELOPMENT.
Rept. no. 1.

Coastal Bend Regional Planning Commission, Corpus Christi, Tex.

Oct 70, 35p

Descriptors: (*Regional planning, *Texas), (*Urban areas, Rebuilding), (*Rural areas, Rehabilitation), (*Hurricanes, Recovery), Surveys, Requirements, Inventories, Classifications, Scheduling, Costs, Interviews, Federal budgets, Texas.
Identifiers: *Hurricane Celia, *Disaster areas, Priorities, Counties, School districts.

The objective of the report is to catalogue a preliminary inventory of priorities and needs for each city, county, and school district within the seven county Hurricane Celia disaster area. (Author)
PB-195 171 HC$3.00 MF$0.65

UNIVERSITY CENTER PROGRAM FOR MANAGEMENT AND TECHNICAL ASSISTANCE IN EDA-DESIGNATED COUNTIES OF ARKANSAS. PROJECT YEAR 1970.
Arkansas Univ., Little Rock. Industrial Research and Extension Center.
For primary bibliographic entry see Field 5C.
PB-195 173 HC$3.00 MF$0.65

REVENUE SHARING AND PAYMENTS IN LIEU OF TAXES ON THE PUBLIC LANDS. VOLUME I.
Interim rept.
Public Land Law Review Commission, Washington, D.C.

Nov 70, 364p* PLLRC-23-1
See also Rept. no. PB-195 186, Vol. 2.

Descriptors: (*Public land, Federal budget), (*State government, Allowances), (*Legislation, Public land), Revenue, Taxes, Substitutes, Data processing, Information systems, Management, Benefit cost analysis, Compensation, Statistical data, Classifications.
Identifiers: *Revenue sharing, *In lieu tax payments, Tax exemptions, Management information systems.

The first volume in a four-volume study analyzes 40 different Federal statutes providing for compensation to states and/or local governmental units through either revenue sharing or in-lieu-tax payments. Revenue sharing ranges from 5 to 90 percent of the receipts received. Also included are analyses of laws dealing with state-owned lands, as well as those of Canada and Australia. Intensive examination was made of 5 states and 50 counties in 19 states to assess the impact of Federal land ownership. (PLLRC abstract)
PB-195 185 HC$3.00 MF$0.65

REVENUE SHARING AND PAYMENTS IN LIEU OF TAXES ON THE PUBLIC LANDS. VOLUME II. APPENDICES 1 AND 2.
Interim rept.
Public Land Law Review Commission, Washington, D.C.

Nov 70, 302p* PLLRC-23-2
See also Volume 3, PB-195 187.

Descriptors: (*Public land, Federal budgets), (*State government, Allowances), (*Legislation, Public land), Revenue, Taxes, Substitutes, Classifications, Projects, Sales, Parks, Waterways (Watercourses), Australia, Canada, United States.
Identifiers: *Revenue sharing, *In lieu tax payments, Management information systems.

The second volume in a four-volume study analyzes 40 different Federal statutes providing for compensation to states and/or local governmental units through either revenue sharing or in lieu tax payments. Included are analyses of laws dealing with state-owned lands, as well as those of Canada and Australia. Intensive examination was made of 5 states and 50 counties in 19 states to assess the impact of Federal land ownership. (PLLRC abstract)
PB-195 186 HC$3.00 MF$0.65

REVENUE SHARING AND PAYMENTS IN LIEU OF TAXES ON THE PUBLIC LANDS. VOLUME III. APPENDIX 3 AND CASE STUDIES (1).
Interim rept.
Public Land Law Review Commission, Washington, D.C.

Nov 70, 575p* PLLRC-23-3
See also Volume 4, PB-195 188.

Descriptors: (*Public land, Federal budgets), (*State government, Allowances), Selection, Data acquistion, Factor analysis, Statistical data, Benefit cost analysis, Colorado, New Hampshire, California, Minnesota, Washington (State).
Identifiers: Case studies, *Revenue sharing, *In lieu tax payments, Counties.

The third volume in a four-volume study analyzes 40 different Federal statutes providing for compensation to states and/or local governmental units through either revenue sharing or in lieu tax payments. Revenue sharing ranges from 5 to 90 percent of the receipts received. Also included are analyses of laws dealing with state-owned lands. Intensive examination was made to assess the impact of Federal land ownership. (PLLRC abstract)
PB-195 187 HC$3.00 MF$0.65

REVENUE SHARING AND PAYMENTS IN LIEU OF TAXES ON THE PUBLIC LANDS. VOLUME IV. CASE STUDIES (2).
Interim rept.
Public Land Law Review Commission, Washington, D.C.

Nov 70, 609p* PLLRC-23-4
See also Volume 1, PB-195 185.

Descriptors: (*Public land, Federal budgets), (*State government, Allowances), Data processing, Factor analysis, Statistical data, Benefit cost analysis, Management, North Carolina, Washington (State), Michigan, Minnesota, Montana, New Mexico, Wyoming, New Hampshire, Utah, Texas, South Dakota, Pennsylvania, Oregon, Nevada.
Identifiers: Case studies, *Revenue sharing, *In lieu tax payments, Counties.

The fourth volume in a four-volume study analyzes 40 different Federal statutes providing for compensation to states and/or local governmental units through either revenue sharing or in lieu tax payments. Intensive examination was made in 5 states to assess the impact of Federal land ownership. (PLLRC abstract)
PB-195 188 HC$3.00 MF$0.65

COMMUNITY DEVELOPMENT PLAN FOR LA GRANGE, ILLINOIS.
La Grange, Ill.
For primary bibliographic entry see Field 13B.
PB-195 197 HC$3.00 MF$0.65

CENTRAL BUSINESS DISTRICT PLAN FOR LA GRANGE, ILLINOIS.
La Grange, Ill.
For primary bibliographic entry see Field 13B.
PB-195 198 HC$3.00 MF$0.65

COMPREHENSIVE CITY PLAN, PERU, ILLINOIS.
Peru City Plan Commission, Ill.
For primary bibliographic entry see Field 13B.
PB-195 265 HC$3.00 MF$0.65

APPLICATION OF CLASSICAL INDUSTRIAL ENGINEERING TECHNIQUES TO SYSTEMS ENGINEERING,
Bettis Atomic Power Lab., Pittsburgh, Pa.
Stephen W. Wuchina. Jul 70, 46p
Contract AT (11-1)-GEN-14

Descriptors: (*Systems engineering, Systems management), (*Industrial engineering, Data processing), Management engineering, Operations research, Man machine systems.

For abstract, see NSA 24 20.
WARD-T-2311 HC$3.00 MF$0.65

5B. Documentation and Information Technology

ANNUAL DESCRIPTIVE BROCHURE.
Basic research achievements Apr 64-Jun 70,
Frank J Seiler Research Lab United States Air Force Academy Colo
Harold Beck, and Milton D. Sprinkel. 1 Jul 70, 107p

Descriptors: (*Air force research, *Reviews), (*Laboratories, Air force research), Mathematics, Chemistry, Aeronautics, Metalorganic compounds, Bibliographies.

The Frank J. Seiler Research Laboratory was established at the United States Air Force Academy to conduct research with a full time staff in chemistry, applied mathematics and aerospace mechanics, to provide a means for supporting faculty research in those areas of interest to the United States Air Force, and to foster and encourage scientific research among cadets. The booklet provides a description of the people and their work. Frank J. Seiler Research Laboratory's activity meshes closely with the current academic program at the USAF Academy, but the Laboratory also continually seeks new ways to relate its research to future capabilities for the Air Force. Toward this end the scientists work closely with members of many governmental, academic, and industrial institutions. (Author)
AD-713 097 HC$3.00 MF$0.65

THE DEVELOPMENT OF AN ON-LINE SEARCHED COORDINATE INDEX FOR USE IN TEACHING AND RESEARCH.
Technical memo.,
Florida State Univ Tallahassee Computer-Assisted Instruction Center
G. Jahoda, and Ferol A. Foos. 30 Sep 70, 40p*
Rept no. CAI-TM-22
Contract N00014-68-A-0494

Descriptors: (*Indexes, Preparation), Education, Scientific research, Decision making, Search theory, Subject indexing.
Identifiers: *Coordinate indexing, Subject index terms.

A model was developed for teaching coordinate index searching and preparation as well as for determining the effect of index and question variables on index performance. In this model coordinate index searching and preparation are considered as a series of decision-making steps. A coordinate index was prepared to 710 documents on library automation, systems studies in libraries, and indexing. The coordinate index has elements of vocabulary control but does not use roles, links, or weighting of index terms. Coordinate index searching and preparation were taught to library school students using classroom instruction, computer-aided instruction and on-line searching of test questions. (Author)
AD-71[illegible]134 HC$3.00 MF$0.65

A TECHNIQUE FOR THE ACQUISITION, STORAGE, AND RETRIEVAL OF SYSTEM

SAFETY INFORMATION - WITH ATTACHED BIBLIOGRAPHY.
Technical rept.,
Martin Marietta Corp Denver Colo Denver Div
George B. Mumma, Thomas J. Lebel, Gary B. McIntire, and Adlyn K. Chappell. Jul 70, 278p*
ASD-TR-69-119
Contracts AF 33 (615)-5196, F33615-69-C-1087

Descriptors: (*Information retrieval, *Safety), Aviation safety, Data storage systems, Classification, Subject indexing, Bibliographies, Guided missile safety, Aerospace craft, Life support.
Identifiers: RAIDS (Rapid Availability of Information and Data for Safety), Rapid availability of information and data for safety, Data acquisition.

A description is given of the RAIDS (Rapid Availability of Information and Data for Safety) method of information storage and retrieval. Acquired data are stored in the library in its original printed form. RAIDS provides three approaches to the identification and retrieval of data. The first approach is to organize the information into logical groups according to corporate authorship and then classify these groups alphabetically; further alphabetizing breaks the information into additional subclasses which are further reduced to item numbers. The second approach provides punched cards to retrieve the subject matter. The third approach provides indexing which identifies all the important ideas or concepts in the document and reduces them to concise, descriptive terms. These terms are coordinated in the index to present logical meaning to the searcher. Therefore, no matter how slight the searcher's recognition term may be, one of the RAIDS approaches will lead to the desired information. (Author)
AD-713 135 HC$3.00 MF$0.65

BIBLIOGRAPHY, WITH ABSTRACTS, OF AFCRL PUBLICATIONS FROM 1 APRIL TO 30 JUNE 1970.
Special repts.
Air Force Cambridge Research Labs L G Hanscom Field Mass

2 Sep 70, 253p Rept nos. AFCRL-70-0491, AFCRL-SR-102
See also AD-707 820.

Descriptors: (*Air force research, *Bibliographies), Military publications, Abstracts, Reports, Scientific research, Periodicals, Geophysics, Environment, Instrumentation.

The bibliography lists all AFCRL in-house reports, journal articles, and contractor reports issued from 1 April to 30 June 1970. (Author)
AD-713 171 HC$3.00 MF$0.65

TECHNICAL INFORMATION - AVAILABILITY VS SELECTIVITY VS COST,
Defense Documentation Center Alexandria Va
Herman W. Miles. Sep 69, 14p* Rept no. DDC-TR-69-2
Presented at the Annual Meeting of National Security Industrial Association - Technical Advisory Committee, Boston, Mass. 16 Sep 69.

Descriptors: (*Information retrieval, Operations research), Documentation, Technical information centers, Costs, Selection, Abundance, Scientific research, Department of Defense.
Identifiers: *Information transfer, *Information need, Information systems.

The goals and objectives of the DDC Development Program for the 1970 era are discussed in relation to the information transfer needs within DoD and how they affect the transfer of information between and among other government organizations. Specific emphasis is placed on the role of the organization generating information in response to the requirements and needs of information users and response to information needed from local scientific and technical information centers to assure better decisions and to establish better information transfer policy. The cost of maintaining information more accessible and on a more selective basis is also discussed. (Author)
AD-713 200 HC$3.00 MF$0.65

THE IMPLEMENTATION OF A RELATIONAL DOCUMENT RETRIEVAL SYSTEM.
Master's thesis,
Illinois Univ Urbana Coordinated Science Lab
Yean-Hsi Chang. Sep 70, 56p* Rept nos. R-489, UILU-ENG-70-234
Contracts DAAB07-67-C-0199, OE-C-1-7-071213-4557

Descriptors: (*Information retrieval, *Search theory), Subject indexing, Programming (Computers), Theses.
Identifiers: ISL programming language, *Index term links, *Relational information retrieval.

A relational document retrieval system is developed that is primarily concerned with hierarchic tree structures and lateral links. The lateral linkages are relationships that cannot be represented within the tree structure representation. A number of annotated examples are given along with a detailed description of the relational data structure and the programs that manipulate and search this structure. The system was programmed in ISL, a string manipulating language designed for information retrieval purposes. (Author)
AD-713 319 HC$3.00 MF$0.65

A CRITICAL EVALUATION OF THE 'MILITARY REVIEW',
Army Command and General Staff Coll Fort Leavenworth Kans
Alonzo L. Coose, Jr. 1970, 48p

Descriptors: (*Military publications, Effectiveness), Reviews, Questionnaires, Data, Analysis.
Identifiers: Evaluation, Objectives.

An evaluation and compilation was made of data relating to the periodical 'Military Review'. A major problem, existing in most of military journals, is that a wide gap has grown between their mission, or what they purport to accomplish and what they actually accomplish. Thus the specific aim of the study was to determine if the 'Military Review' is accomplishing its assigned mission.
AD-713 374 HC$3.00 MF$0.65

AN ALGORITHM FOR THE SYNTACTIC ANALYSIS IN THE R2 INFORMATION SYSTEM,
Illinois Univ Urbana Coordinated Science Lab
Jeffrey A. Schultz, and William T. Bielby. Oct 70, 44p Rept nos. R-494, UILU-ENG-70-239
Contract DAAB07-67-C-0199, Grant OF-C-1-7-071213-4557

Descriptors: (*Information retrieval, *Syntax), Analysis, Programming (Computers), Algorithms, Transformational grammars, Phrase structure grammars.
Identifiers: LISP 1.5 programming language, R2 information retrieval system, IBM 360/75 computers.

The paper presents a pure syntax parsing algorithm for the R2 question answering system. The parsing is a necessary part in the processing of information for the retrieval of answers by giving the syntactic structure of both questions and statements of fact. The syntactic analysis is performed on individual statements by using grammatical rules and various grammatical transformation. The parser has been implemented in LISP 1.5 on an IBM 360/75 computer. Experimental results from the system include examples of the analysis of some compound and a complex sentences, as well as simple sentences. (Author)
AD-713 431 HC$3.00 MF$0.65

A DATA STRUCTURE FOR COGNITIVE INFORMATION RETRIEVAL,
Illinois Univ Urbana Coordinated Science Lab
K. O. Biss, R. T. Chien, and F. A. Stahl. Oct 70, 22p* Rept nos. R-493, UILU-ENG-70-238
Contract DAAB07-67-C-0199, Grant OE-C-1-7-071213-4557

Descriptors: (*Information retrieval, Design), Data processing systems.
Identifiers: Natural language.

A new data structure developed in connection with a natural language question-answering system is described. The data structure is based upon a new high-order calculus. It allows a great degree of expressiveness and is suitable for extensive logical deduction. The inadequacies of low-order schemes for the representation of natural language information are given. A formal description of the new high-order structure which overcomes these inadequacies is then presented along with the properties that make it more suitable and attractive for machine processing of natural language information. (Author)
AD-713 432 HC$3.00 MF$0.65

PROCEEDINGS OF THE ARMY SCIENCE CONFERENCE (1970), HELD AT UNITED STATES MILITARY ACADEMY, WEST POINT, N. Y. ON 16-19 JUNE 1970. VOLUME I. PRINCIPAL AUTHORS A THROUGH G.
Conference rept. no. 7.
Office of the Chief of Research and Development (Army) Washington D C

23 Sep 70, 462p*
Report on The Needs of the Modern Soldier in His Current and Future Environment. See also Volume 2, AD-713 533 and Volume 4, AD-511 900. 1968 Proceedings: Volume 1, AD-837 098L and Volume 2, AD-837 141L.

Descriptors: (*Army research, *Symposia), Radar, Detectors, Wounds + injuries, Ordnance, Psychometrics, Materials, Military rations, Mechanics, Chemistry, Military medicine, Mathematics, Optics, Fluid mechanics, Electrical engineering.
Identifiers: United States Military Academy, Vesications, Fluerics.

The conference presented a cross section of the many significant scientific and engineering programs carried out by the Department of the Army. The proceedings of the conference are a compilation of all papers presented at the conference and the supplemental papers that were submitted.
AD-713 500 HC$3.00 MF$0.65

PROCEEDINGS OF THE ARMY SCIENCE CONFERENCE (1970) HELD AT UNITED STATES MILITARY ACADEMY, WEST POINT, N. Y. ON 16-19 JUNE 1970. VOLUME II. PRINCIPAL AUTHORS H THROUGH L.
Conference rept. no. 7.
Office of the Chief of Research and Development (Army) Washington D C

24 Sep 70, 384p*
Report on The Needs of the Modern Soldier in His Current and Future Environment. See also Volume 3, AD-713 561.

Descriptors: (*Army research, Symposia), Spectroscopy, Radar, Mechanics, Military medicine, Mathematics, Fluid mechanics, Data processing systems, Ordnance, Explosive materials, Crystallography, Body armor, Diet, Electromagnetic waves.
Identifiers: United States Military Academy.

The conference presented a cross section of the many significant scientific and engineering programs carried out by the Department of the Army. The proceedings of the conference are a compilation of all papers presented at the conference and the supplemental papers that were submitted.
AD-713 533 HC$3.00 MF$0.65

PROCEEDINGS OF THE ARMY SCIENCE CONFERENCE (1970), HELD AT UNITED STATES MILITARY ACADEMY, WEST POINT, N. Y. ON 16-19 JUNE 1970. VOLUME III. PRINCIPAL AUTHORS M THROUGH Z.
Conference rept. no. 7.
Office of the Chief of Research and Development (Army) Washington D C

24 Sep 70, 408p
Report on the Needs of the Modern Soldier in His Current and Future Environment. See also Volume 4, AD-511 900.

Descriptors: (*Army research, Symposia), Fluid mechanics, Lasers, Tolerances (Physiology), Propellants, Mathematical models, Military medicine, Photogrammetry, Ordnance, Thermodynamics, Electron beams, Materials, Psychometrics, Chemistry, Optics.
Identifiers: United States Military Academy.

The conference presented a cross section of the many significant scientific and engineering programs carried out by the Department of the Army. The proceedings of the conference are a compilation of all papers presented at the conference and the supplemental papers that were submitted.
AD-713 561 HC$3.00 MF$0.65

A MARC II BASED SYSTEM: STUDIES ON THE AIR FORCE CAMBRIDGE RESEARCH LIBRARY BIBLIOGRAPHY PROCESSING SYSTEM.
Final rept. 1 Jun 68-31 May 70,
Inforonics Inc Maynard Mass
Liam M. Kelly. 21 Jul 70, 106p* AFCRL-70-0428
Contract F19628-68-C-0371

Descriptors: (*Data storage systems, Libraries), Catalogs, Data processing systems, Information retrieval, Compatibility.
Identifiers: *Bibliographic information, MARC 2 data processing system.

The central focus of the project was on data encoding and the development of routines, and techniques for the conversion of AFCRL and/or Library of Congress supplied bibliographic data into a machine readable information record format based upon the Library of Congress MARC II Communications Format. The system was developed, programmed, and tested. (Author)
AD-713 673 HC$3.00 MF$0.65

SCIENTISTS OF UKRAINIAN SSR HIGHER EDUCATIONAL INSTITUTIONS,
Joint Publications Research Service, Washington, D.C.
V. M. Popov, and V. I. Polurez. 25 Sep 70, 915p
Trans. of mono. Ucheni Vuziv Ukrainskoi RSR, Kiev, 1968 516p.

Descriptors: (*Professional personnel, USSR), Bibliographies, Biographies, Translations.
Identifiers: *Ukranian Soviet Socialist Republic.

The document represents a first attempt to systematize and synthesize basic information on the teaching, scientific and sociopolitical activities of that large company of leading scientists working in the higher educational institutions of the Ukrainian SSR. This scientific who's who contains brief biographical data, information on area of scholarly specialization and contribution to the development of a given branch of science, participation in the civic life of the city, oblast, republic or country on the part of the leading scientists and scholars of the institutions of higher learning of the Ukrainian SSR -- professors and doctors of science, active members and corresponding members of academies of sciences, recipients of Lenin and Peace Prizes, honored scientists and technologists. Also listed are the main contributions of these scientists and scholars, for the most part published works: monographs, textbooks and manuals, as well as the most important pamphlets. Appended to the main body of entries is a listing of doctors of science by field and a listing of scientists and scholars by institution. Some general information on the activities of Ukrainian scientists and scholars, obtained from an analysis of substantial factual material, is contained in the introductory section. (Author)
JPRS-51436 HC$10.00 MF$0.65

INSTITUTE FOR AEROSPACE RESEARCH ANNUAL PROGRESS REPORT, 1969.
Toronto Univ. (Ontario). Inst. for Aerospace Research.

Nov 69, 175p
Contracts DRB-G-9501-02, DRB-G-9511-92

Descriptors: *Aerospace engineering, *Air transportation, *Research and development, Aeronautical engineering, Canada, Explosions, Fatigue tests, Hypersonic speed, Implosions, Lasers, Magnetohydrodynamics, Plasma dynamics, Rarefied gases, Satellite control, Shock waves, Subsonic speed, Surface reactions, Transition flow, Unsteady flow.

For abstract, see STAR 08 21.
N70-38116 HC$3.00 MF$0.65

AGARD BULLETIN - MEETINGS. PUBLICATIONS. MEMBERSHIP, JANUARY 1970.
Advisory Group for Aerospace Research and Development, Paris (France).
Jan 70, 48p AGARD-BULL-70-1

Descriptors: *Aerospace sciences, *Bibliographies, *Conferences, Aerospace medicine, Avionics, Data processing, Documents, Electromagnetic wave transmission, Flight mechanics, Fluid dynamics, Research and development.

For abstract, see STAR 08 21.
N70-38493 HC$3.00 MF$0.65

OPERATION OF A SPECIALIZED SCIENTIFIC INFORMATION AND DATA ANALYSIS CENTER WITH COMPUTER BASE AND ASSOCIATED COMMUNICATIONS NETWORK,
Oak Ridge National Lab., Tenn.
Wm. B. Cottrell, J. R. Buchanan, and D. W. Cardwell. Aug 70, 53p*
Contract W-7405-eng-26

Descriptors: (*Information centers, Operations), Data processing, Safe handling, Telecommunication.
Identifiers: Management information systems.

For abstract, see NSA 24 20.
ORNL-TM-3078 HC$3.00 MF$0.65

DESIGN OF A STATISTICAL INFORMATION SYSTEM FOR PRODUCT RELATED INJURIES.
Final contract rept. Jan-Mar 70,
Westat Research, Inc., Bethesda, Md.

31 Mar 70, 125p* NCPS-WV-265
Contract NCPS-70-158

Descriptors: (*Information systems, *Safety), Accidents, Surveys, Injuries, Sampling, Expenses, Design, Statistical data.
Identifiers: *Product safety.

To identify products associated with injury, it is necessary to design a national information system that is statistically valid. The report describes recommended sources of injury data, sampling methods, validity follow-up, and in-depth surveillance follow-up for a product-related injury reporting system. The report includes a discussion on personnel needs, administration and costs. (Author)
PB-194 871 HC$3.00 MF$0.65

CHICAGO AREA EXPRESSWAY SURVEILLANCE PROJECT ON THE DEVELOPMENT OF A FREEWAY DRIVER INFORMATION SYSTEM.
Interim rept.,
Illinois State Div. of Highways.
Kenneth W. Heathington. Aug 69, 294p
Prepared in cooperation with Bureau of Public Roads, Washington, D.C.

Descriptors: (*Information systems, *Freeways), (*Motor vehicle operators, *Attitudes), (*Vehicular traffic, Information systems), Safety, Subject index terms.
Identifiers: Chicago area expressway surveillance project.

The research is concerned with the development of a Freeway Driver Information System capable of providing real-time traffic information to freeway users and potential users and set in a format which might be incorporated into the operational structure of the Chicago Area Expressway Surveillance Project. The primary objective of the system is to obtain maximum efficiency from the use of existing highway facilities before embarking on the construction of new and costlier ones. The analytical work is directed toward the investigation of driver attitudes toward an information system centered around three major areas: (l) an evaluation of the priorities associated with the provision of a Freeway Driver Information System, (2) an evaluation of potential diversion to alternate routes and current diversionary practices, and (3) an evaluation of driver preferences for alternative visual information displays. The attitudes toward priority of providing information relative to limited specified improvements in highway facilities can be used by the decision maker as a basis for establishing allocation of resources to highway facilities. The potential response to diversion and current diversionary behavior can be used to estimate the potential response to a Freeway Driver Information System. The evaluation of the reception, comprehension, and response to visual information displays can be used as inputs to a Freeway Driver Information System. (Author)
PB-194 894 HC$3.00 MF$0.65

CSIRO ABSTRACTS, VOLUME 18 NUMBER 7 JULY 1970.
Commonwealth Scientific and Industrial Research Organization, Melbourne (Australia).

Jul 70, 68p
See also Volume 18, no. 6 dated Jun 70, PB-192 269.

Descriptors: (*Research, *Abstracts), Genetics, Veterinary medicine, Chemistry, Computers, Dairies, Entomology, Oceanography, Food processing, Wood products, Horticulture, Irrigation, Land, Mathematics, Meteorology, Physics, Soils, Textiles, Grazing land, Wildlife, Translations, Australia.

Contents: Abstracts of CSIRO published papers (Abstracts 834-950, Author index, Subject index); Translations.
PB-194 967 HC$3.00 MF$0.65

CSIRO ABSTRACTS, VOLUME 18 NUMBER 8 AUGUST 1970.
Commonwealth Scientific and Industrial Research Organization, Melbourne (Australia).
Aug 70, 81p
See also Volume 18, Number 7 dated Jul 70, PB-194 967.

Descriptors: (*Research, *Abstracts), Genetics, Veterinary medicine, Chemistry, Computers, Dairies, Entomology, Oceanography, Food processing, Wood products, Horticulture, Irrigation, Land, Mathematics, Meteorology, Physics, Soils, Textiles, Grazing land, Wildlife, Translations, Australia.

Contents: Abstracts of CSIRO published papers (Abstracts 951-1076, Author index, Subject index); Translations.
PB-194 968 HC$3.00 MF$0.65

INDEX OF CONFERENCE PROCEEDINGS RECEIVED BY THE NLL. CONFERENCE NUMBERS 70-03067 - 70-03463.
National Lending Library for Science and Technology, Boston Spa (England).
Sep 70, 28p NLL-36
Paper copy also available from National Lending Library for Science and Technology, Boston Spa, Yorkshire, Great Britain. See also Rept. no. 35, PB-195 022.

Descriptors: (*Meetings, *Indexes (Documentation)), Bibliographies, Research, Social sciences, Subject index terms, Great Britain.

All types of conference proceedings are covered, including those which appear in serial form, those reporting individual conferences and published as books and those published as parts of normal serials. A list of subject keywords is included. (Author)
PB-195 021 HC$3.00 MF$0.65

INDEX OF CONFERENCE PROCEEDINGS RECEIVED BY THE NLL. CONFERENCE NUMBERS 70-02420 - 70-03066.
National Lending Library for Science and Technology, Boston Spa (England).
Aug 70, 39p NLL-35
Paper copy also available from National Lending Library for Science and Technology, Boston Spa, Yorkshire, Great Britain. See also Rept. no. 33, PB-192 500, and Rept. no. 36, PB-195 021.

Descriptors: (*Meetings, *Indexes (Documentation)), Bibliographies, Research, Social sciences, Subject index terms, Great Britain.

All types of conference proceedings are covered, including those which appear in serial form, those reporting individual conferences and published as books and those published as parts of normal serials. A list of subject keywords is included. (Author)
PB-195 022 HC$3.00 MF$0.65

REPORT TO THE NATIONAL SCIENCE FOUNDATION ON GN-793 AWARDED TO THE OHIO ACADEMY OF SCIENCE,
Ohio Academy of Science, Columbus.
John H. Melvin. 1970, 80p*

Descriptors: (*Journalism, Meetings), Periodicals, Editing, Information retrieval, Research, Documents.

Contents: Keeping alive in the information explosion; The role of the editor; Format, style and policy; Editor-author interaction; Journal business management; The administration of journal affairs; A printer's comments; The journal and the exchange librarian; A national discipline oriented information system and its implications; Welcome to chemical abstracts; Interaction with secondary media; The chemical abstracts service library support system; Information processing at chemical abstracts service; A look at the future - journal editing, systems, and organizations. The report also includes information concerning the organization of the meeting during which the above listed papers were presented.
PB-195 255 HC$3.00 MF$0.65

REPORT TO THE NATIONAL SCIENCE FOUNDATION ON GN-700 AWARDED TO THE ASSOCIATION OF AMERICAN UNIVERSITY PRESSES.
Association of American Univ. Presses, New York.
1970, 120P*

Descriptors: (*Information sciences, Meetings), Journalism, Documentation, Data processing.

A tutorial conference on future documentation and information handling techniques is reported.
PB-195 256 HC$3.00 MF$0.65

PRELIMINARY DEVELOPMENT OF A COOPERATIVE INTERNATIONAL COMPUTER-BASED CHEMICAL INFORMATION NETWORK.
Annual rept. no. 1.
Chemical Abstracts Service, Columbus, Ohio.
Feb 70, 44p
Grant NSF-GN-816

Descriptors: (*Chemistry, *Information centers), Cost estimates, Western Europe, Canada, Data processing, Management planning.
Identifiers: *Chemical information systems, International cooperation.

An American Chemical Society (ACS) program proposes a cooperative effort to establish local information centers in participating countries for the dissemination of scientific information from available data bases. Some of the centers may also qualify to serve as centers for gathering and processing input to an ACS-based information network in the future. In this manner, nations will share in the processing and dissemination of scientific information. The report covers the activities related to the development of the international computer-based scientific information network under the ACS program.
PB-195 259 HC$3.00 MF$0.65

CSIRO ABSTRACTS, VOLUME 18, NUMBER 9, SEPTEMBER 1970.
Commonwealth Scientific and Industrial Research Organization, Melbourne (Australia).

Sep 70, 73p
Abstracts of CSIRO published papers: translations. See also Volume 18, no. 8 dated Aug 70, PB-194 968.

Descriptors: (*Research, *Abstracts), Veterinary medicine, Physiology, Zoology, Chemistry, Computers, Dairies, Entomology, Fisheries, Oceanography, Food, Wood products, Horticulture, Irrigation, Land, Mathematics, Meteorology, Nutrition, Physics, Soils, Textiles, Grazing land, Wildlife, Translations, Australia.

Contents: Abstracts of CSIRO published papers, (Abstracts 1077 - 1188, Author index, Subject IINDEX); Translations.
PB-195 264 HC$3.00 MF$0.65

USE OF DATA-BASE ACCESS FOR INTERINDEXER COMMUNICATION AND FOR INDEXER TRAINING,
California Univ., Berkeley. Lawrence Radiation Lab.
J. Joanne Herr. Jul 70, 4p CONF-701004-2
Contract W-7405-eng-48

Descriptors: (*Coordinate indexing, Feasibility), Personnel development, Decentralization (Dispersal), Communications management, Education.
Identifiers: Data bases.

For abstract, see NSA 24 20.
UCRL-19862 HC$3.00 MF$0.65

5C. Economics

AREA HANDBOOK FOR COLOMBIA,
American Univ Washington D C Foreign Area Studies Div
Thomas E. Weil, Jan Knippers Black, Kenneth W. Martindale, David S. McMorris, and Frederick P. Munson. Aug 70, 588p DA-PAM-550-26
Availability: Paper copy available from Superintendent of Documents, GPO, Washington, D. C. 20402. Price $3.00 as D101.22:550-26/2.

Descriptors: (*Colombia, Handbooks), Economics, Political science, Sociology, Armed Forces (Foreign), Law, Police.
Identifiers: *Area studies.

The book represents an effort to provide a compact and objective exposition and analysis of the dominant social, political, and economic characteristics of Colombian society. It is designed to give readers an understanding of the dynamics of the component elements of Colombian society and an insight into the needs, goals, and achievements of its people. A large number of consultants, many of them with firsthand knowledge of the country, have provided data not available in printed sources. (Author)
AD-713 082 MF$0.65

AREA HANDBOOK FOR NICARAGUA,
American Univ Washington D C Foreign Area Studies Div
John Morris Ryan, Robert N. Anderson, Harry R. Bradley, Carl E. Negus, and Robert B. Johnson.
Jul 70, 397p DA-PAM-550-88
Availability: Paper copy available from Superintendent of Documents, GPO, Washington, D. C. 20402. Price $3.00 as D101.22:550-88.

Descriptors: (*Nicaragua, *Handbooks), Economics, Political science, Sociology, Transportation, Armed forces (Foreign).
Identifiers: *Area studies.

Nicaragua is one of the smaller countries of the Western Hemisphere. Published sources about it and its people have tended to be fragmentary and sporadic. Although it has a literary tradition, there has been no systematic account of its society. This book is an attempt to provide an integrated exposition and analysis of the dominant social, political, and economic aspects of the society. It is designed to give an understanding of the dynamics of the component elements of the society and an insight into the ideas and feelings, the goals, and the hopes and fears of its people. (Author)
AD-713 083 MF$0.65

EQUILIBRIUM AND DEMAND FOR MEDIA OF EXCHANGE IN A PURE EXCHANGE ECONOMY WITH TRANSACTIONS COSTS,
Yale Univ New Haven Conn Cowles Foundation for Research in Economics
Ross M. Starr. 1 Oct 70, 32p Rept no. Discussion Paper-300
Sponsored in part by Office of Naval Research, Washington, D. C.

Descriptors: (*Economics, Management planning), (*Commerce, Mathematical models), Money, Costs, Matrix algebra, Set theory, Distribution (Economics).
Identifiers: Equilibrium models, Demand (Economics), Marketing.

Mathematical general equilibrium analysis has to date developed almost completely without reference to monetary phenomena or money as a commodity. Clearly this leaves us somewhat at sea in looking for a mathematical general equilibrium analysis of a monetary economy. This gap in the theory reflects actually a more fundamental lacuna, the absence of a theory of transactions. Money's primary function--the one from which its other roles derive--is as a medium of exchange, a facilitator of transactions. But what do transactions look like in a general equilibrium model. The story that is usually told to describe the market of a general equilibrium model is something like this: All the traders get together in one place with an auctioneer. The latter eventually calls out equilibrium prices. All traders then put their excess supplies at those prices into a central pile of goods and withdraw from that pile their excess de-

mands. Because the prices are equilibrium prices, supplies and demands balance and no trader is left with an unsatisfied demand. (Author)
AD-713 143 HC$3.00 MF$0.65

PRELIMINARY REVIEW AND ANALYSIS OF FLOOD CONTROL PROJECT EVALUATION PROCEDURES.
Intasa Menlo Park Calif
For primary bibliographic entry see Field 8H.
AD-713 482 HC$3.00 MF$0.65

INTERIM-INPUT OUTPUT RESOURCE ALLOCATION MODEL,
Center for Naval Analyses, Arlington, Va.
For primary bibliographic entry see Field 15E.
AD-866 655 HC$3.00 MF$0.65

THE DEVELOPMENT OF RESEARCH ACTIVITIES IN THE FOOTWEAR INDUSTRY. A STUDY OF THE POTENTIAL NEEDS AND ACHIEVEMENTS OF RESEARCH, TECHNOLOGY AND OTHER INTELLECTUAL ACTIVITIES IN THE FOOTWEAR INDUSTRY.
Summary rept.,
Lowell Technological Inst. Research Foundation, Mass.
Charles J. Colazzo, Jr. Apr 70, 88p*
Prepared in cooperation with Northeastern Univ., Boston, Mass., and the Merrimack Valley Industrial Information Center. Sponsored in part by Massachusetts Dept. of Commerce and Development, Boston.

Descriptors: (*Footwear, Research projects), Market research, Leather, Economic factors, Product development, Libraries, Museums, Public relations, Health, France, Great Britain, West Germany, Netherlands, Africa, Boots, Shoes.

The footwear and leather industries although steadily declining are traditionally important factors in the economy. Increased footwear research is recognized as an approach to assist the industry in halting the decline of the domestic footwear industry's share of the United States Market. The establishment of an intellectual center for the footwear industry comprising a museum, library and research center with the possible addition later of a technical school of college graduate level could be making some contribution to the solution of the problems of the footwear industry. In addition to the current problem of imports there are many other problems it could help with. Some of these problems exist now and some can be foreseen in the near future. These problems fall into various classes, such as production, distribution, or other economic types; personnel or training problems; public relations or political problems; and pure research in the physical or social sciences applicable to the footwear industry. (LTIRF abstract)
PB-194 870 HC$3.00 MF$0.65

RESOURCES AND FISHERIES OF TUNAS AND RELATED FISHES IN THE ATLANTIC OCEAN,
Far Seas Fisheries Research Lab., Shimizu (Japan).
Sigeiti Hayasi, Tsutomu Koto, Chiomi Shingu, Susumu Kume, and Yasuo Morita. 1970, 116p*
Contrib-28

Descriptors: (*Fisheries, Atlantic Ocean), (*Tunas, Fisheries), Natural resources, Fishing grounds, Statistical data, Migrations, Maturation, Regulations, Animal ecology, Japan.

Contents: Status of the tuna fisheries resources in the Atlantic Ocean, 1956--67; Comments to rational utilization of the yellowfin tuna in the Atlantic Ocean; A comparative study on efficiency of the surface and longline fisheries for exploitation of tuna and related species.
PB-194 882 HC$3.00 MF$0.65

READINGS IN CONCEPTS AND METHODS OF NATIONAL INCOME STATISTICS,
Office of Business Economics, Washington, D.C.
George Jaszi, Charles F. Schwartz, Lawrence Grose, and Irving Rottenberg. 1970, 290p* OBE-SUP-70-02

Descriptors: (*Income, Statistical data), (*Economic surveys, Income), Economic analysis, Concepts, Classifications, Expenses, Investments, Organizations, Government policies, Accounting.
Identifiers: *Gross national product, National income statistics.

The basic conceptual structure of the national income and product statistics first published in 1954 are reprinted along with revisions introduced in 1958 and 1965. The statistical procedures, their modifications and extensions, are also covered. How GNP is deflated is discussed in detail in a paper published in 1967. (OBE abstract)
PB-194 900 HC$3.00 MF$0.65

A STOCHASTIC INVESTMENT MODEL FOR A SURVIVAL CONSCIOUS FISHING FIRM.
Texas A and M Univ., College Station. Inst. of Statistics.
For primary bibliographic entry see Field 5A.
PB-194 905 HC$3.00 MF$0.65

A PROGRAM OF TECHNICAL ASSISTANCE TO INDUSTRY IN TWENTY-SIX MISSISSIPPI COUNTIES AND THE CHOCTAW INDIAN RESERVATION, 1969-70.
Final rept.,
Mississippi Research and Development Center, Jackson. Management and Technical Services Div.
Robert C. Grider, Marilyn Mills, and Jeanne A. Powers. Sep 70, 88p EDACOMM-70-009
Grant EDA-04-6-09079-2

Descriptors: (*Industrial management, *Project planning), (*Economic development, *Mississippi), Organizations, Meetings, Employment, Economic surveys, Classifications, Ethnic groups.
Identifiers: Job creation, Technical assistance, Counties, Minority owned enterprises, Choctan Indians, Indian reservations.

The report deals with work in 26 counties to help firms expand and diversify or maintain current operating levels and also help entrepreneurs establish new business ventures. Technical assistance was given companies and individuals. Meetings were held with chamber of commerce officials, bankers, and development groups. Through these efforts about 2,600 jobs have been created, and there is potential for creation of additional jobs. (Supplied abstract)
PB-195 018 HC$3.00 MF$0.65

PREPARATION AND EXECUTION OF SEMINARS EXPLAINING USE AND IMPLEMENTATION OF MODEL MANAGEMENT INFORMATION SYSTEM FOR INSTITUTIONS OF HIGHER EDUCATION,
Ozarks Regional Commission.
Gerald L. McManis. Oct 70, 42p EDACOMM-70-011
Contract EDA-TA-68-12
Prepared in cooperation with McManis Associates, Washington, D.C.

Descriptors: (*Economic development, Regional planning), (*Information systems, Universities), (*Management, Meetings), Recommendations, Federal budgets, Income, Models, Arkansas, Kansas, Missouri, Oklahoma.
Identifiers: *Management information systems, *Ozarks region, Higher education.

The study reports on planning and research to help close the per capita income gap between the Ozarks Region and the Nation. One result has been the decision to construct and operate a regional resources management information system. The report recommends that support of the U.S. Office of Education should be sought to implement the model system. A series of seminars was held in the Ozarks region to inform top educational administrators of how the system can help institutions of higher education assist in the economic development of their States. The region includes parts of Arkansas, Kansas, Missouri, and Oklahoma. (EDA abstract)
PB-195 020 HC$3.00 MF$0.65

FUTURE DEMANDS ON THE PUBLIC LANDS. VOLUME I: POLICY IMPACTS OF FUTURE DEMANDS,
Public Land Law Review Commission, Washington, D.C.
Elmer F. Bennett, Eugene E. Hughes, and Leland O. Graham. Oct 70, 80p* PLLRC-21-1
Republished with revisions. See also Volume 2, PB-195 042.

Descriptors: (*Public land, Demand (Economics)), (*Government policies, Impact), Law (Jurisprudence), Land use, Predictions, Trends, Economic analysis, Decision making, Natural resources, Recreation, Forest lands, Water supply, Mineral deposits.
Identifiers: Management information systems.

The report provides a concise statement of the broad implication of the projections of consumption and demand for policies concerning the supplying of various commodities from the public lands. It deals with the conceptual problems of making and using projections of demand, relevance of projected demand to public land policy, economic considerations affecting policies for supplying commodities from the public lands, and projected trends in resource use and their implication for supplying these commodities. (PLLRC abstract)
PB-195 041 HC$3.00 MF$0.65

FUTURE DEMANDS ON THE PUBLIC LANDS. VOLUME II: PROJECTIONS OF THE CONSUMPTION OF COMMODITIES PRODUCIBLE ON THE PUBLIC LANDS OF THE UNITED STATES 1980-2000.
Public Land Law Review Commission, Washington, D.C.

Oct 70, 447p* PLLRC-21-2
Contract PLLRC-68-C-1
Republished with revisions. Prepared in cooperation with Nathan (Robert R.) Associates, Washington, D.C. See also Volume 3, PB-195 043.

Descriptors: (*Public land, Demand (Economics)), (*Demand (Economics), Mathematical prediction), Commodity management, Economic analysis, Demography, Labor, Agricultural products, Chemical industry, Mineral deposits, Wood products, Recreational facilities, Land use, Water resources.
Identifiers: Outdoor recreation, Management information systems.

The report contains projections for the years indicated of the likely future national and, in some cases, regional demands that can be expected for commodities producible on the public lands whether or not actually produced on them now or in the future. (PLLRC abstract)
PB-195 042 HC$3.00 MF$0.65

FUTURE DEMANDS ON THE PUBLIC LANDS. VOLUME III: PROBABLE FUTURE DEMANDS ON PUBLIC LANDS,
Public Land Law Review Commission, Washington, D.C.
Robert S. Manthy. Oct 70, 221p* PLLRC-21-3
Contract PLLRC-70-C-1
Republished with revisions. Prepared in cooperation with Nathan (Robert R.) Associates, Inc., Washington, D.C. See also Volume 4, PB-195 044.

Descriptors: (*Public land, Demand (Economics)), (*Demand (Economics), Forecasting), Commodity management, Mathematical prediction, Statistical analysis, Agricultural products, Forage crops, Fishing, Wildlife, Recreational facilities, Forestry, Water resources, Mineral products, Government policies.
Identifiers: Outdoor recreation.

The report translates the overall projections of national and regional demands 1980-2000, as covered by Vol. 2 of the study, into projections of demands likely to be placed on the public lands to produce the needed commodities. (PLLRC abstract)
PB-195 043 HC$3.00 MF$0.65

FUTURE DEMANDS ON THE PUBLIC LANDS. VOLUME IV. PROBABLE FUTURE DEMANDS ON THE PUBLIC LANDS FOR NEW CITIES AND URBAN EXPANSION,
Public Land Law Review Commission, Washington, D.C.
Marion Clawson, Raymond M. Smith, and Daniel W. Cook. Oct 70, 333p* PLLRC-21-4
Contract PLLRC-70-C-10
Republished with revisions. Prepared in cooperation with Urban America, Inc., Washington, D.C. See also Volume 1, PB-195 041.

Descriptors: (*Public land, Demand (Economics)), (*Urban planning, Surveys), Predictions, Probability, Land use, Decision making, Opinions, Legislation, Urban areas.

The report is chiefly concerned with considering plans and recommendations for the development of a Federal policy to support or encourage the development of new urban areas and/or the expansion of existing ones and the role public lands might play in the development of new urban areas in public land regions. (PLLRC abstract)
PB-195 044 HC$3.00 MF$0.65

FINAL REPORT OF LOS ANGELES ASSOCIATION OF GENERAL SUB AND SPECIALTY CONTRACTORS,
Los Angeles Association of General, Sub and Specialty Contractors, Calif.
John Brown. 1 May 70, 93p EDACOMM-70-007

Descriptors: (*Economic development, *California), (*Contract management, Urban planning), Contractors, Problem solving, Management, Industrial training, Counseling, Communicating, Statistical data, Personnel, Meetings.
Identifiers: Los Angeles (California), Minority owned enterprises, Subcontractors, Technical assistance.

The report notes trends toward solution of problems confronting small and minority contractors in Los Angeles. These include training and counseling in administrative and management techniques, efforts to establish a revolving bond and working capital fund, identification of contract opportunities, working with governmental and private groups re contracts, and use of communications with contractor and others in the construction industry. Agreements are reported with major contractor associations and with individual contractors to increase opportunities for small contractors. (EDA abstract)
PB-195 051 HC$3.00 MF$0.65

EVALUATION OF AN EXPERIMENTAL FISH REDUCTION PROCESS APPLICABLE TO SMALL FISHERIES.
Bureau of Commercial Fisheries, Ann Arbor, Mich.
For primary bibliographic entry see Field 6H.
PB-195 052 HC$3.00 MF$0.65

ECONOMIC DEVELOPMENT CENTER.
Annual rept. 10 Oct 67-10 Jan 69,
PACT Inc., San Francisco, Calif.

10 Jan 69, 40p EDACOMM-70-006
Contract C-114-66

Descriptors: (*Economic development, *Central city), (*Urban planning, *California), Commerce, Technical reports, Negroes, Surveys, Manpower, Financing, Consulting services.
Identifiers: *San Francisco (California), *Minority enterprises, *Business counseling, *Economically depressed areas, Technical assistance projects.

The report on PACT (Plan of Action for Challenging Times), Inc., reviews needs for use of economic techniques in economic planning in place of social-oriented programs. Such action was taken in depressed parts of San Francisco through establishment of a technical and planning staff, business counseling, assisting in establishment of larger businesses and in encouraging minority businessmen to locate in the central business districts. A research and consultant center was established, its major job being a manpower study in connection with an industrial park to be built in the Butchertown area. There was also a study on black business problems and their solutions. A directory of black business in San Francisco has been compiled. (EDA abstract)
PB-195 077 HC$3.00 MF$0.65

TEXAS MARINE RESOURCES. A SUMMARY OF COASTAL ACTIVITIES.
Summary rept.,
Texas Engineering Experiment Station, College Station. Industrial Economics Research Div.
John Miloy, and Worth M. Blake. Feb 70, 24p
TAMU-SG-70-105
Grant NSF-GH-59
Report on Sea Grant Program.

Descriptors: (*Economic development, *Texas), (*Natural resources, *Coasts), (*Regional planning, Texas), Economic surveys, Demography, Earnings, Employment, Harbors facilities, Education, Industries, Government policies, Coordination, Waterways (Transportation), Economic analysis.
Identifiers: Sea Grant project, *Marine resources, *Mexico Gulf, Marine industries.

The summary presents the findings of a study of marine resources activities in Texas. The purpose of the survey was to prepare an inventory of agencies and organizations in Texas participating in activities related to the marine environment of the Gulf of Mexico. In addition to identifying these groups involved in marine related activities, every attempt was made to determine the level of marine related activity of each organization including specific projects, programs and direct expenditures for these efforts. (Author)
PB-195 078 HC$3.00 MF$0.65

TEXAS MARINE RESOURCES: THE LEGAL-ADMINISTRATIVE VIEW.
Texas A and M Univ., College Station.

Jul 70, 22p TAMU-SG-70-112
Grant NSF-GH-59
Report on Sea Grant Program. A consensus rept. of Marine Resources: The Law and Administration of the Coastal Zones; a workshop held at the Houston Univ., Bates Coll. of Law.

Descriptors: (*Economic development, *Texas), (*Natural resources, *Coasts), (*Legislation, Natural resources), Meetings, Management, Requirements, Zoning, Law (Jurisprudence), Recommendations, Land use, Transportation.
Identifiers: Sea Grant project, *Marine resources, *Mexico Gulf.

The document reports on a workshop on the legal-administrative problems of the Texas coastal zone. The booklet represents a summary statement of the topics which were explored and recommendations which were made at that workshop.
PB-195 079 HC$3.00 MF$0.54

WATER RESOURCES AND LAND USE OF THE PYRAMID LAKE INDIAN RESERVATION.
Wilsey and Ham, San Mateo, Calif.
For primary bibliographic entry see Field 13B.
PB-195 088 HC$3.00 MF$0.65

TEXAS MARINE RESOURCES: THE PORTS AND WATERWAYS VIEW.
Texas Engineering Experiment Station, College Station. Industrial Economics Research Div.

Aug 70, 19p TAMU-SG-70-114
Grant NSF-GH-59
Report on Sea Grant Program. Consensus report of Marine Resources: Texas Ports and Waterways; A Workshop for Texas Marine Transportation Users and Developers Held at Port Arthur, Tex. 27-28 May 70.

Descriptors: (*Economic development, *Texas), (*Natural resources, Coasts), (*Waterways (Transportation), Texas), (*Harbor facilities, Texas), Meetings, Requirements, Problem solving, Government policies, Management planning, Classifications, Handling equipment, Containerizing, Recommendations.
Identifiers: Sea Grant project, *Marine resources, *Mexico Gulf.

The report represents a consensus statement of the participants at the workshop. The meeting represented the first time a major university program has attempted to assist port directors and planners in identifying common goals and recommendations for action by state government. Specific topics considered were: The current needs of Texas ports that can be served by the Sea Grant Program; The major problems hindering the development of Texas ports; and actions by federal, state, or local governments which would be helpful in stimulating the growth of Texas ports.
PB-195 090 HC$3.00 MF$0.65

TEXAS MARINE RESOURCES: THE FISHERIES VIEW.
Texas A and M Univ., College Station. Dept. of Animal Science.
Bryant F. Cobb. Aug 70, 14p TAMU-SG-70-115
Grant NSF-GH-59

Descriptors: (*Economic development, *Texas), (*Fisheries, Texas), (*Natural resources, Fisheries), Coasts, Fishes, Shellfish, Statistical data, Value, Weight (Mass), Problem solving, Shrimps, Industrial processes, Manpower, Economic analysis.
Identifiers: *Marine resources, Sea Grant project, *Mexico Gulf, Marine industries.

The report, based on information supplied by several key individuals representing the Texas fishing industry, describes briefly the economic importance of the industry and some of the issues facing Texas fishing interests.
PB-195 091 HC$3.00 MF$0.65

ARKANSAS' PRELIMINARY PLAN FOR ECONOMIC DEVELOPMENT IN THE OZARKS. 1970 SUPPLEMENT.
Ozarks Regional Commission.

15 May 70, 12p EDACOMM-70-014

Descriptors: (*Economic development, Arkansas), (*Regional planning, *Arkansas), Manpower, Information systems, Contracts, Industrial training, Management planning, Investments.
Identifiers: Ozarks region.

The report supplements a preliminary plan for economic development in the Ozarks, presenting an annual revision of the state plan. Additional ways of strengthening the existing industrial development program are discussed. Arkansas' strategy de-emphasizes the importance of conven-

tional public works projects in favor of direct action programs that seek to identify investment opportunities and aid production expansions. Ozarks investment plans described in the report reflect this approach.
PB-195 139 HC$3.00 MF$0.65

TEXAS MARINE RESOURCES. THE INDUSTRIAL VIEW.
Summary rept.
Texas A and M Univ., College Station.

Apr 70, 12p TAMU-SG-70-107
Grant NSF-GH-59
Report on Sea Grant Program.

Descriptors: (*Economic development, *Texas), (*Natural resources, *Coasts), (*Industrial management, Natural resources), Meetings, Factor analysis, Industries, Classifications, Requirements, Planning.
Identifiers: Sea Grant project, *Marine resources, Marine industries, *Mexico Gulf.

The industrial workshop was attended by 31 selected representatives from the Texas coastal industry community, 11 representatives from State and Federal agencies, and 9 from the Texas A and M University staff. Specific topics considered were: Directions of industry going in marine resource development; The current needs of industry that can be served by the Sea Grant Program; Achievement of advice and support to the Sea Grant Program from industry; Actions by the State of Texas which would be most helpful to industry or the development of marine resources.
PB-195 152 HC$3.00 MF$0.65

INLAND PORT FACILITIES AND ECONOMIC GROWTH,
Mississippi State Univ., State College. Bureau of Business and Economic Research.
A. A. Armenakis, H. J. Moore, and G. T. Peden.
1970, 88p W71-00473, OWRR-A-032-MISS (1)

Descriptors: (*Economic surveys, *Mississippi), (*Marine terminals, Inland waterways), (*Economic development, Marine terminals), Economic analysis, Growth, Income, Earnings, Classifications, Comparison, Matrix methods, Statistical analysis, Industries, Employment.
Identifiers: *Inland port facilities, Counties.

Overall economic growth for each of three Mississippi inland port counties was compared to the aggregate of all non-port counties for the period 1959-1968. The measures selected were total personal income, total earnings, farm earnings, nonfarm earnings and manfacturing earnings. The role of each Mississippi inland port in economic growth was analyzed first by comparing the growth rates for Mississippi inland ports to other inland ports on the Mississippi River System during the period 1959-1968; and second, by studying the changes in commodity groups handled by each Mississippi inland port during the study period. An intra-port analysis of each Mississippi inland port provided the basis for concluding that the existence of each port made an important contribution to economic growth. An analysis of the relative contribution of each port in 1968 to its respective regional economy was performed by constructing partial input-output tables for each port county. (WRSIC abstract)
PB-195 166 HC$3.00 MF$0.65

UNIVERSITY CENTER PROGRAM FOR MANAGEMENT AND TECHNICAL ASSISTANCE IN EDA-DESIGNATED COUNTIES OF ARKANSAS. PROJECT YEAR 1970.
Annual rept.
Arkansas Univ., Little Rock. Industrial Research and Extension Center.

Jul 70, 60p EDACOMM-70-005
Contract EDA-08-6-09072-1

Descriptors: (*Economic development, *Arkansas), Technical reports, Summarizing, Meetings, Education, Management methods, Regional planning, Statistical data, Questionnaires.
Identifiers: *Technical assistance projects, Counties, Minority owned enterprises.

The primary purpose of the report is to review the technical assistance activities industrial research and extension center for the period June 1969 to June 1970. The major portion of this report is dedicated to describing the educational programs conducted as a part of this project and the field service cases which were active during the reporting period. The summary covers the types of services provided, the approaches used, and the types and locations of firms or organizations for which the work was performed. (Author)
PB-195 173 HC$3.00 MF$0.65

THE CHANGING STRUCTURE OF EMPLOYMENT AND INCOME IN THE FOUR CORNERS REGION,
Georgia Univ., Athens. Dept. of Real Estate and Urban Development.
Charles F. Floyd. Aug 70, 172p Rept. no. 3
EDACOMM-70-008
See also Rept. no. 2, PB-195 183.

Descriptors: (*Economic development, Employment), (*Employment, Earnings), Economic surveys, Statistical data, Trends, Income, Employment, United States, Comparison, Factor analysis, Arizona, Colorado, New Mexico, Utah.
Identifiers: *Four corners region.

The study is concerned with the income gap in the Four Corners region which has widened since 1950, with families in the region having incomes lower than did average families in the United States as a whole. The Four Corners Region, which includes 91 counties in Arizona, Colorado, New Mexico, and Utah, has had a lower-than-average rate of employment growth. The future economic development of the region is discussed.
PB-195 183 HC$3.00 MF$0.65

THE CHANGING STRUCTURE OF EMPLOYMENT AND INCOME IN THE UPPER GREAT LAKES REGION,
Georgia Univ., Athens. Dept. of Real Estate and Urban Development.
Charles F. Floyd. Apr 70, 149p Rept. no. 2
EDACOMM-70-010
See also Rept. no. 1, PB-183 412, and Rept. no. 3, PB-195 183.

Descriptors: (*Economic development, Employment), (*Employment, Earnings), Statistical data, Deterioration, Income, Economic surveys, Classifications, Demography, Industries, Michigan, Minnesota, Wisconsin.
Identifiers: *Great Lakes region, Changes (Transitions), Economic decline.

The study is concerned with economic decline experienced by the upper Great Lakes region examplified by a lack of economic opportunity, leading to heavy out-migration from the region, and attended by slow population growth. Upper Great Lakes economy must grow much faster than the national economy simply to keep the income gap from widening farther. Need is seen for significant restructuring of regional employment towards higher-wage industries. The region consists of parts of Michigan, Minnesota, and Wisconsin.
PB-195 184 HC$3.00 MF$0.65

THE ECONOMICS OF FISH PROTEIN CONCENTRATE.
Massachusetts Inst. of Tech., Cambridge.
For primary bibliographic entry see Field 6H.
PB-195 226 HC$3.00 MF$0.65

5D. History, Law, and Political Science

COMMUNIST CHINA'S EVOLVING MILITARY STRATEGY AND DOCTRINE.
Research paper.
Institute for Defense Analyses Arlington Va International and Social Studies Div
Alice Langley Hsieh. Jun 70, 70p Rept no. RP-P-646 IDA/HQ-70-11553
Contract DAHC15-67-C-0013

Descriptors: (*China, *Military strategy), Foreign policy, Communism, Vietnam, USSR, Japan, United States, Guided missiles (Surface-to-surface), Nuclear explosions, Satellites (Artificial).
Identifiers: International relations.

The document analyzes China's evolving military strategy and doctrine, focuses on three main issues in China's military thinking: the question of priorities in national security policy; the degree to which Chinese leadership style in the military sphere is cautious or reckless; and the intent of China's advanced weapons program. With a view to developing new insights into these issues, several recent crisis situations, trends in international politics, and developments in China's military program are explored. The paper proceeds to suggest some major implications for China's military development and to project ways in which Peking might choose to use its evolving nuclear-missile capability over the next decade. (Author)
AD-713 067 HC$3.00 MF$0.65

AREA HANDBOOK FOR COLOMBIA,
American Univ Washington D C Foreign Area Studies Div
For primary bibliographic entry see Field 5C.
AD-713 082 MF$0.65

AREA HANDBOOK FOR NICARAGUA,
American Univ Washington D C Foreign Area Studies Div
For primary bibliographic entry see Field 5C.
AD-713 083 MF$0.65

FORECASTING ASIAN STRATEGIC ENVIRONMENTS FOR NATIONAL SECURITY DECISIONMAKING: A REPORT AND A METHOD,
Rand Corp Santa Monica Calif
Wayne Wilcox. Jun 70, 57p* Rept no. RM-6154-PR
Contract F44620-67-C-0045

Descriptors: (*Southeast Asia, *Political science), Models (Simulations), Japan, India, USSR, China, United States, Predictions, Military strategy.
Identifiers: International relations, *Political forecasting.

The report presents a description of a forecasting model, based on political and technological forecasting techniques, to help decisionmakers identify salient futures for present policy consideration. The Alternative Salient Futures (ASF) forecast is reported for India in 1980, offering several dimensions for analytical presentation. ASF is then applied to a five-power Asia in 1980 with changing governments in the United States, USSR, CPR, Japan, and India under two alternative conditions: an American troop and aid withdrawal from all Asian commitments and an American withdrawal of troops only. (Author)
AD-713 096 HC$3.00 MF$0.65

A STUDY OF THE NEED FOR ARREST POWERS BY FEDERAL TROOPS PERFORMING CIVIL DISTURBANCE MISSIONS.
Thesis.
Army Command and General Staff Coll Fort Leavenworth Kans
David H. Stem. 1970, 46p

Descriptors: (*Disasters, Law), (*Law, Armed Forces operations), United States Government, Police, Army research.
Identifiers: *Civil disturbances, *Riots, *Arrest powers.

By analyzing missions performed by Federal troops in civil disturbance situations and reviewing techniques which might accomplish the same purpose, a determination is made of the need for arrest powers. (Author)
AD-713 356 HC$3.00 MF$0.65

THE GREAT POWERS AND THE DISSOLUTION OF THE SWEDISH-NORWEGIAN UNION.
Thesis
Army Command and General Staff Coll Fort Leavenworth Kans
Henrik O. Lunde. 1970, 92p

Descriptors: (*Sweden, *History), (*Norway, History), Political science, Great Britain, France, USSR, Army research, Theses.

Contents: German policy in the Norwegian-Swedish controversy 1895-1905; The question of recognition and the question of revision and renewal of the November treaty; Germany and the Norwegian candidature question; England and the Norwegian candidature question; The Karlstad Conference and French-Russian intervention.
AD-713 380 HC$3.00 MF$0.65

POLITICAL CADRE SYSTEMS IN THE MILITARY.
Individual research elective,
Army Command and General Staff Coll Fort Leavenworth Kans
Monte R. Bullard. Jun 70, 196p

Descriptors: (*Military organizations, *Political science), Taiwan, China, USSR, Vietnam, Army operations, Tactical warfare, Theses.
Identifiers: *Political cadre systems.

The paper discusses the concept of political cadre systems within military establishments. Primary research centered on the system in the Republic of China Army. Secondary sources were used to obtain background information to place the ROC system in perspective. Secondary sources concerning other political cadre systems (USSR, Peoples' Republic of China, and the Republic of Vietnam) were also used to highlight topical areas for study and to show alternative ways of coping with similar problems. Personal experience in the Republics of China and Vietnam was used whenever possible. Significant conclusions are: Political cadre systems can cause the armed forces of a nation to contribute positively to the stability of democratic as well as communistic nations. They can be especially effective at reducing the desertion rates, increasing the efficiency of support troops, and increasing the esprit of combat troops. They are especially useful in developing nations. (Author)
AD-713 414 HC$3.00 MF$0.65

IMPACT OF PACIFICATION ON INSURGENCY IN SOUTH VIETNAM,
Rand Corp Santa Monica Calif
R. W. Komer. Aug 70, 20p Rept no. P-4443
Availability: Paper copy available from the RAND Corp., Santa Monica, Calif. $1.00. No copies furnished by DDC or NTIS.

Descriptors: (*Insurgency, Vietnam), (*Population, Protection), (*Rural areas, *Vietnam), Countermeasures, Control systems, Political science, Attitudes, Public relations, Economics, Effectiveness, Reviews, Impact.
Identifiers: *Pacification, South Vietnam.

In at least one area the U.S. has consciously attempted not to overmilitarize or over-Americanize the war in Vietnam, but rather to cope with its rural revolutionary and largely political dimension. This attempt is known as pacification. The efforts have been designed more or less to serve two central aims: sustained protection of the rural population from the insurgents, which also helps to deprive the insurgency of its rural popular base and generating rural support for the Saigon regime via programs meeting rural needs and cementing the rural areas politically and administratively to the center. A secondary purpose has been to help neutralize the active insurgent forces and apparatus in the countryside. In essence it is a civil as well as a military process. (Author)
AD-713 430

THE FLOW OF INTERNATIONAL EVENTS, JANUARY-JUNE, 1970.
Annual technical rept.,
University of Southern California Los Angeles Dept of International Relations
Wayne Richard Martin. Jul 70, 58p
Contract N00014-67-A-0269-0004
Report on World Event/Interaction Survey. See also Interim report dated Jan 70, AD-700 935.

Descriptors: (*Political science, Reviews), History, Middle East, Vietnam, West Germany, Cambodia, Arabia, Israel, Statistical analysis.
Identifiers: *International relations, Paris Peace Talks, International events.

The Annual Technical Report continues the procedure of statistically summarizing recent international events which was initiated in the January 1970 Interim Technical Report. A record of 4550 events has been collected for the six month period January 1 through June 30, 1970. These data are characterized and compared with event data for previous six month periods beginning January 1, 1966. The report describes both similarities and differences between the first half of 1970 and the earlier periods. At the conclusion of this review an annotated list of WEIS research completed or in progress during the reporting period July 1, 1969 through June 30, 1970 is provided. (Author)
AD-713 486 HC$3.00 MF$0.65

DOCUMENTS ON DISARMAMENT, 1969,
Arms Control and Disarmament Agency Washington D C
Robert W. Lambert, Ruth Ihara, and Jean Mayer. Aug 70, 839p Rept no. ACDA-Pub-55
Availability: Paper copy available from Superintendent of Documents, GPO, Washington, D. C. 20402. $3.50 as AC1.11/2:969. See also report dated 1968. AD-703 891.

Descriptors: (*Disarmament, Records), Arms control, Government (Foreign), Foreign policy, United States Government, National defense, International law, United Nations, Nuclear weapons, Nuclear explosions.
Identifiers: International relations.

The publication contains basic documents on arms control and disarmament developments during the year. The documents are printed chronologically. They are preceded by a topical list of documents and followed by a chronological list. (Author)
AD-713 498 MF$0.65

THE IMPLICATIONS OF LEAD REMOVAL FROM AUTOMOTIVE FUEL.
Dept. of Commerce, Washington, D.C. Panel on Automotive Fuels and Air Pollution.
For primary bibliographic entry see Field 13B.
PB-194 880 HC$3.00 MF$0.65

ZONING ORDINANCE OF THE CITY OF MYRTLE BEACH.
South Carolina State Planning and Grants Div., Columbia.
For primary bibliographic entry see Field 13B.
PB-194 904 HC$3.00 MF$0.65

ANALYSIS OF INFORMATION TO BE INCLUDED IN DRIVER LICENSE FILE.
Final rept. (Volume 1),
Research Triangle Inst., Durham, N.C. Operations Research and Economics Div.
D. C. Jones, and B. A. Moser. Jul 70, 137p RTI-FR-OU-472-1 DOT-HS-800 292
Contract FH-11-7253
See also Volume 2, PB-194 978.

Descriptors: (*Licenses, Information), (*Motor vehicle operators, Licenses), Data processing, Law (Jurisprudence), Standards, State government, Selection, Identifying, Document storage.
Identifiers: *Driver licensing.

The purpose of the research program was to provide the basis for a set of recommendations to the States on information that should be obtained during the initial driver license application. Data processing and information renewal considerations were also studied. The recommendations resulting from the study are presented. (Author)
PB-194 977 HC$3.00 MF$0.65

GUIDELINES FOR INFORMATION TO BE INCLUDED IN DRIVER LICENSE FILE.
Final rept. (Volume 2).
Research Triangle Inst., Durham, N.C. Operations Research and Economics Div.

Jul 70, 36p* RTI-FR-OU-472-2 DOT-HS-800 293
Contract FH-11-7253
See also Volume 3, PB-194 979.

Descriptors: (*Licenses, Information), (*Motor vehicle operators, Licenses), Data processing, Instructions, Forms (Paper), Data acquisition, Recommendations, Standards, State government, Medical records, Physiology, Biographies.
Identifiers: *Driver licensing.

The purpose of the report is to suggest guidelines for the development of the initial driver license application form and to recommend what initial driver licensing information should be obtained, how and where it should be obtained, and the length and place of its retention. (Author)
PB-194 978 HC$3.00 MF$0.65

INITIAL DRIVER LICENSE QUESTIONNAIRE SUMMARY.
Final rept. (Volume 3),
Research Triangle Inst., Durham, N.C. Operations Research and Economics Div.
D. C. Jones, and S. K. Stouffer. Jul 70, 99p* RTI-FR-OU-472-3 DOT-HS-800 294
Contract FH-11-7253
See also Volume 4, PB-194 980.

Descriptors: (*Licenses, Information), (*Motor vehicle operators, Licenses), Questionnaires, Standards, Data acquisition, Medical records, Physiology, Biographies.
Identifiers: *Driver licensing.

The report is a summary of the driver licensing survey conducted as part of a study performed to develop guidelines for initial driver licensing. The study, of which the survey is a part, is concerned with determining biographical and medical/physiological data that should be obtained from persons applying for their initial driver license. The study codified the reasons for licensing and determined what information was essential for each of these reasons. In justifying the information requirements, consideration was given to: (1) the data being collected by the states, (2) research information available in the published literature, and (3) knowledge of experts in various aspects of driver licensing and highway safety. (Author)
PB-194 979 HC$3.00 MF$0.65

BIBLIOGRAPHY ON DRIVER LICENSING.
Final rept.,

Research Triangle Inst., Durham, N.C. Operations Research and Economics Div.
D. C. Jones, and S. K. Stouffer. Apr 70, 39p* RTI-FR-OU-472-4 DOT-HS800 295
Contract FH-11-7253
See also Volume 1, PB-194 979.

Descriptors: (*Licenses, Information), (*Motor vehicle operators, Licenses), Bibliographies.
Identifiers: *Driver licensing.

The bibliography lists approximately 400 references pertaining to driver licensing.
PB-194 980 HC$3.00 MF$0.65

PROJECT DRIVER.
Final rept. on phase 1A,
Oklahoma Univ. Research Inst., Norman.
Jerry L. Purswell. 1970, 67p* DOT-HS-800 304
Contract FH-11-7126
Prepared in cooperation with the Oklahoma State Dept. of Public Safety, Oklahoma City.

Descriptors: (*Licenses, *Motor vehicle operators), Effectiveness, Safety, Performance tests.
Identifiers: *Driver licensing.

The study is concerned with one phase of driver licensing, the testing of applicants using a new method. An investigation was conducted to evaluate the effectiveness of one new method proposed for improving the pre-drive testing procedures used during driver licensing. A description of the purposes for conducting the research, the experimental methods used, and the results obtained is given. (Author)
PB-195 133 HC$3.00 MF$0.65

LEGAL ASPECTS OF WATER STORAGE FOR FLOW AUGMENTATION,
Virginia Polytechnic Inst., Blacksburg. Water Resources Research Center.
For primary bibliographic entry see Field 13B.
PB-195 170 HC$3.00 MF$0.65

REVENUE SHARING AND PAYMENTS IN LIEU OF TAXES ON THE PUBLIC LANDS. VOLUME I.
Public Land Law Review Commission, Washington, D.C.
For primary bibliographic entry see Field 5A.
PB-195 185 HC$3.00 MF$0.65

REVENUE SHARING AND PAYMENTS IN LIEU OF TAXES ON THE PUBLIC LANDS. VOLUME II. APPENDICES 1 AND 2.
Public Land Law Review Commission, Washington, D.C.
For primary bibliographic entry see Field 5A.
PB-195 186 HC$3.00 MF$0.65

REVENUE SHARING AND PAYMENTS IN LIEU OF TAXES ON THE PUBLIC LANDS. VOLUME III. APPENDIX 3 AND CASE STUDIES (1).
Public Land Law Review Commission, Washington, D.C.
For primary bibliographic entry see Field 5A.
PB-195 187 HC$3.00 MF$0.65

REVENUE SHARING AND PAYMENTS IN LIEU OF TAXES ON THE PUBLIC LANDS. VOLUME IV. CASE STUDIES (2).
Public Land Law Review Commission, Washington, D.C.
For primary bibliographic entry see Field 5A.
PB-195 188 HC$3.00 MF$0.65

5E. Human Factors Engineering

WHAT MOVES, THE AIRPLANE OR THE WORLD. A REVIEW OF THE MOTION RELATIONSHIP PROBLEM IN PRESENTING AIRCRAFT ATTITUDE AND GUIDANCE INFORMATION.
Illinois Univ Savoy Aviation Research Lab
For primary bibliographic entry see Field 1D.
AD-713 179 HC$3.00 MF$0.65

HUMAN PERFORMANCE EXPERIMENTATION IN NIGHT OPERATIONS: TECHNOLOGY AND INSTRUMENTATION FOR FIELD RESEARCH.
Technical research note,
Army Behavior and Systems Research Lab Arlington Va
Aaron Hyman, Jack J. Sternberg, and James H. Banks. Jun 70, 27p Rept no. BESRL-TRN-223
Report on Night Operations Program.

Descriptors: (*Target acquisition, *Night warfare), (*Night vision, Electronic equipment), (*Performance (Human), Effectiveness), Man-machine systems, Sensors, Data processing systems, Programming (Computers), Recording systems, Control panels, Instrumentation, Teletype systems, Real time, Stabilized platforms, Magnetic tape, Optical equipment.
Identifiers: *Low light level viewing, Computer analysis.

The NIGHT OPERATIONS program is concerned with problems in optimizing human performance in relation to night vision devices and related sensors. The present publication provides a description and evaluation of the effectiveness of an instrumentation system developed under concepts provided by BESRL research scientists. The primary objective in this phase of the research was to develop an instrumentation system, embodying the requirements and essential characteristics for effective and accurate measurement of target detection and search behavior in field testing. (Author)
AD-713 463 HC$3.00 MF$0.65

FISCAL YEAR 1971 WORK PROGRAM FOR THE DEPARTMENT OF THE ARMY RESEARCH AND DEVELOPMENT IN TRAINING, MOTIVATION, AND LEADERSHIP.
Human Resources Research Organization Alexandria Va
For primary bibliographic entry see Field 5I.
AD-713 626 HC$3.00 MF$0.65

DEVELOPMENT OF INFORMATION REQUIREMENTS AND TRANSMISSION TECHNIQUES FOR HIGHWAY USERS.
Research rept.,
Texas Transportation Inst., College Station.
G. J. Alexander, G. F. King, M. S. Warskow, and Donna McGlamery. Jul 70, 70p* RR-606-1
Contract FH-11-7031
Condensation of the NCHRP 3-12 Draft.

Descriptors: (*Motor vehicle operators, *Visual communication), (*Human factors engineering, *Highways), Design, Visual perception, Man machine systems, Planning.
Identifiers: *Highway signs.

Driver information needs occur throughout the entire driving task and include pretrip planning. Driver information needs fall into a hierarchy with a distinct primacy relative to satisfying those needs. Use of the primacy concept of information needs is an important requirement of highway information design. The highway information system must consider all informal and formal information transmission. The basic requirements of the highway information system are given. Basic design principles for the systematic presentation of information to the driver are also given. The transmission of information to satisfy the macroperformance needs can best be accomplished by formalizing and improving the driver's trip planning ability and making maximum use of signs as transmitters by optimizing their use, as to location, message content, and design. Procedures were developed for information system applications, which incorporate driver needs analysis, the concept of primacy, and the use of informal aiding techniques in the design of the sign system. (Author)
PB-194 954 HC$3.00 MF$0.65

ANNOTATED BIBLIOGRAPHY AND SUMMARY OF RESEARCH NEEDS IN THE HUMAN FACTORS ASPECTS OF DRIVER VISUAL COMMUNICATIONS.
Background rept.,
Texas Transportation Inst., College Station.
R. L. Street, A. M. Mayyasi, and F. E. Berngen. Jul 70, 62p* RR-606-2
Contract FH-11-7031

Descriptors: (*Motor vehicle operators, *Visual communication), (*Human factors engineering, *Highways), Design, Visual perception, Symbols.
Identifiers: Information processing (Psychology), Highway signs.

The report presents a literature survey, summarizes the pertinent work related to the project and gives appropriate recommendations related thereto. This effort covers two main areas: (1) Visual input requirements in the driving task, and (2) Human information-processing capability in complex tasks. (Author)
PB-194 955 HC$3.00 MF$0.65

PSYCHOPHYSIOLOGICAL MEASUREMENTS AS RELATED TO THE OPERATION OF A MOTOR VEHICLE.
Research rept.,
Texas Transportation Inst., College Station.
Newton C. Ellis, and Donna McGlamery. Jul 70, 28p RR-606-3
Contract FH-11-7031

Descriptors: (*Visual communication, Highways), (*Man machine systems, Motor vehicles), (*Motor vehicle operators, Psychophysiology), Design criteria, Environments, Models (Simulations), Arousal, Respiration, Skin (Anatomy), Body temperature, Blood pressure, Comfort, Heart rate, Texas.

The purpose of the study was to determine the feasibility of using physiological parameters as a source of design criteria for the highway visual communication environment. Source material was reviewed, and a model for relating physiological performance, driver behavior and highway design features was introduced and evaluated on the basis of previous research. It was concluded that the model, because of its measurable parameters, could be used in evaluations of the general roadway environment. The physiological indices considered applicable to the purpose of the report are identified, and the manner in which they might be used is briefly presented. (Author)
PB-194 956 HC$3.00 MF$0.65

SIGNIFICANT POINTS FROM THE DIAGNOSTIC FIELD STUDIES: SUMMARY REPORT.
Research rept.,
Texas Transportation Inst., College Station.
D. L. Woods, N. J. Rowan, and J. H. Johnson. Sep 70, 111p* RR-606-4
Contract FH-11-7031

Descriptors: (*Visual communication, *Vehicular traffic control), (*Information systems, *Highways), (*Motor vehicle operators, Opinions), Questionnaires, Design standards, Traffic signals, Highway lighting, Display devices, Access roads, Freeways, Intersections, Traffic engineering.
Identifiers: Parking control, Guardrails, *Diagnostic field studies, Highway lanes, Pavement markings, Driver expectancy, Highway direction signs.

The report provides a description of the highway visual communications systems study techniques and procedures. The comments from interviews and questionnaires form the basis for the material presented. Responses have been organized into seven broad categories pertaining to highway visual communications. Also included is a classification according to roadway function. A code has been used to designate freeway, arterial, and two-lane facilities. Some of the topics discussed are pertinent to all three types of facilities, others are areas of concern for two, and a few concern one. The report makes considerable use of photographs of the highway environment to illustrate the points being made. (Author)
PB-194 983 HC$3.00 MF$0.65

AUERBACH FINAL REPORT ON AN EVALUATION OF THE EMERGENCY LOAN PROGRAM.
Auerbach Corp., Philadelphia, Pa.

May 70, 199p* AUER-1704-TR-1
Grant OEO-B99-4844

Descriptors: (*Economic development, Federal budgets), (*Credit, Policies), (*Projects, Evaluation), Urban areas, Rural areas, Financial management, Organizations, Demography, Negroes, Effectiveness, Economic conditions.
Identifiers: *Loans, Credit unions, Demonstration programs, Community action agencies, Puerto Ricans, Poor white Americans, American Indians, Mexican Americans.

The emergency loan program (ELP) is a low-income loan program based on the 1966 amendments to the Economic Opportunity Act, to demonstrate that lending to the poor would work and could be effective as part of an overall attack on underlying causes of poverty. It has produced mixed results, and the document makes recommendations on its future. (OEO abstract)
PB-195 146 HC$3.00 MF$0.65

5F. Humanities

THE LITERATURE OF COMMAND: DELINEATIONS OF THE FLAG RANK MILITARY OFFICER IN THE CONTEMPORARY AMERICAN WAR NOVEL,
Army Command and General Staff Coll Fort Leavenworth Kans
Peter G. Jones. Jun 70, 100p

Descriptors: (*Officer personnel, Personality), (*Performance (Human), Warfare), Libraries, Reviews, Attitudes, Pattern recognition, Sociometrics.
Identifiers: *Literature (Fine arts), American war novels, Fiction.

Many of the better war novels written since World War 2 are focused on the high-ranking military commander. Whereas in the early novels general officers were merely undifferentiated, functionalized creatures of the environment that wars inevitably produce, these books examine commanders in detail, creating figures whose personal and professional attributes produce implications that reach beyond the battlefield, sometimes not dissipated by war's end. The document examines the fictional portrayal of such officers. (Author)
AD-713 377 HC$3.00 MF$0.65

BULLETIN OF THE RADIO AND ELECTRICAL ENGINEERING DIVISION OF THE NATIONAL RESEARCH COUNCIL OF CANADA. VOLUME 20, NUMBER 2, APRIL-JUNE 1970.
National Research Council of Canada Ottawa (Ontario) Radio and Electrical Engineering Div
For primary bibliographic entry see Field 9C.
AD-713 683

5G. Linguistics

AN ALGORITHM FOR THE SYNTACTIC ANALYSIS IN THE R2 INFORMATION SYSTEM,
Illinois Univ Urbana Coordinated Science Lab
For primary bibliographic entry see Field 5B.
AD-713 431 HC$3.00 MF$0.65

A NOTE ON GRAMMARS WITH COORDINATES.
Technical rept.,
Maryland Univ College Park Computer Science Center
David L. Milgram, and Azriel Rosenfeld. Sep 70, 14p Rept no. TR-70-140
Contract Nonr-5144 (00)

Descriptors: (*Grammars, Set theory), Analysis.

Anderson has defined the notion of a 'graphical rewriting grammar', in which each production has an associated set of functions that compute coordinates for the symbols in the production's right member in terms of given coordinates of the symbols in its left member. It is shown that any such 'Anderson grammar' (AG) is equivalent to a 'one-dimensional' AG whose productions are all 'left-linear'; thus the power of an AG can be restricted only by restricting its coordinate-computing functions. On the other hand, even if the productions of an AG are left-linear and its functions are all computable by finite automata, its language need not be finite-state or even context-free. (Author)
AD-713 695 HC$3.00 MF$0.65

FORMANT-FREQUENCY TRAJECTORIES IN SELECTED CVC-SYLLABLE NUCLEI,
Speech Communications Research Lab Inc Santa Barbara Calif
David J. Broad, and Ralph H. Fertig. 10 Oct 69, 14p
Contract N00014-67-C-0118
Availability: Pub. in Jnl. of the Acoustical Society of America, v47 n6 pt2 p1572-1582 Jun 70.

Descriptors: (*Phonetics, Frequency), English language, Analysis of variance.
Identifiers: Vowels.

The frequencies of the first three vowel formants in 1728 monosyllables containing the Midwestern American English vowel /I/ (as in fit) were measured by means of a computer-assisted technique employing a data-display screen, light pen, and television camera. Two-way analyses of variance for various time points of the formant trajectories reveal that nonlinear interaction between initial and final consonants is relatively small and that the influences of both initial and final consonants are highly significant throughout the vowel. A linear model gives the mean formant trajectory for a given consonantal context as the sum of a target frequency, an initial consonant transition function, and a final consonant transition function. The distributions of the differences between the model trajectories and the actual trajectories are reasonably approximated by normal stochastic processes. These distributions are interpreted not as errors of the model, but, rather, as due predominantly to the variability between syllable tokens of the same syllable type. (Author)
AD-713 768

MEI-2 SYNTACTICAL TRANSLATOR,
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 9B.
AD-713 771 HC$3.00 MF$0.65

REPRESENTING NATURAL-LANGUAGE INFORMATION IN PREDICATE CALCULUS,
Stanford Univ Calif Dept of Computer Science
For primary bibliographic entry see Field 12A.
AD-713 841 HC$3.00 MF$0.65

MATHEMATICAL LINGUISTICS AND AUTOMATIC TRANSLATION,
Harvard Univ., Cambridge, Mass. Aiken Computation Lab.
Susumu Kuno. Feb 70, 347p* NSF-24
See also PB-193 407.

Descriptors: (*Linguistics, Research), Syntax, Semantics, Transformational grammars, English language, Japanese language.

Contents: Syntactic orientation as a semantic property; Counterparts, or the problem of reference in transformational grammar; The role of deduction in grammar; Presuppositions and relative grammaticality; Feature changing rules in semantics; Reference in logic and reference in English; Former and latter; Agent, experiencer and controllability; On complementizers--toward a syntactic theory of complement types; Be as a main verb; What seems to be; A reply to 'On Declarative Sentences'; Theme, contrast, and exhaustive listing -- wa and ga in Japanese.
PB-194 855 HC$3.00 MF$0.65

5H. Man-Machine Relations

ELECTROPHYSIOLOGICAL MEASURES OF CROSS-SENSORY INTERACTION IN THE CENTRAL NERVOUS SYSTEM,
Human Engineering Labs Aberdeen Proving Ground Md
For primary bibliographic entry see Field 6P.
AD-713 567 HC$3.00 MF$0.65

DISCUSSION OF MANUAL CONTROL PROBLEMS.
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
J. H. Golmon. 27 Dec 68, 33p NASA-TM-X-53906, IN-AERO-68-7

Descriptors: *Human performance, *Manual control, *Off-on control, *Spacecraft control, Differential equations, Human reactions, Mathematical models, Neuromuscular transmission, Response time (computers).

For abstract, see STAR 08 21.
N70-38309 HC$3.00 MF$0.65

5I. Personnel Selection, Training, and Evaluation

MILITARY AND CIVILIAN EARNINGS ALTERNATIVES FOR ENLISTED MEN IN THE ARMY.
Research paper,
Institute for Defense Analyses Arlington Va Program Analysis Div
Gary R. Nelson, and Catherine Armington. Jul 70, 58p Rept no. RP-P-662 IDA/HQ-70-11636
Contract DAHC15-68-C-0342

Descriptors: (*Army personnel, *Wages), (*Recruiting, Decision making), Statistical analysis, Labor, Education, Classification, Job analysis, Intelligence tests, Manpower studies, Employment.
Identifiers: Comparison, Military pay, Civilian earnings, Civilian employment, Alternatives, Ethnic groups.

The document reports on estimates of the military and civilian earnings alternatives facing the first-term enlisted man at the time of his reenlistment decision. This estimation is performed for first-termers in the Army who decided between military and civilian alternatives for 1966-67. Estimation was made of 'average' earnings by level of education, mental test score, military occupational specialty, and race. The earnings stream of two alter-

natives are compared in terms of probable financial gain or loss. (Author)
AD-713 066 HC$3.00 MF$0.65

DESIGN OF AN OPTIMUM NAVY ENLISTED CLASSIFICATION STRUCTURE. ANALYSIS OF THE REQUIREMENT FOR THE COMMUNICATIONS YEOMAN (CYN) SERVICE RATING.
Rept. no. 5,
Naval Personnel Research and Development Lab Washington D C
Gene L. Lane, and Nandor A. Hrutkay. Oct 70, 30p Rept no. WRM-71-19

Descriptors: (*Naval personnel, Classification), (*Communication systems, Job analysis), Military requirements, Manpower studies, Radio operators, Continuum mechanics, Naval training, Attitudes.
Identifiers: *Navy enlisted classifications, Communication personnel, Yeomen, Evaluation.

Communication systems managers have expressed interest as to the need for and desirability of continuation of the communications yeoman (CYN) service rating in consideration of changes which have occurred in naval communications and the radioman general rating. The objective of the research is to determine and analyse the current and continuing requirements for the CYN service rating. (Author)
AD-713 089 HC$3.00 MF$0.65

TRAINING FEEDBACK ON THE AN/SRC-20, 21 RADIO SETS.
Research rept.,
Naval Personnel and Training Research Lab San Diego Calif
Chester R. Bilinski, John C. Saylor, and Lloyd S. Standlee. Oct 70, 65p Rept no. SRR-71-9

Descriptors: (*Radio equipment, Naval training), (*Naval training, Feedback), (*Electronic technicians, Naval training), Questionnaires, Job analysis, Performance (Human), Test equipment, Problem solving, Effectiveness.
Identifiers: AN/SRC-20, AN/SRC-21.

A job analysis was made of the maintenance requirements of the AN/SRC-20. 21 Radio Sets. Based upon the job analysis, a structured interview, check lists, and a card sort were used to obtain information from a fleet sample of technicians concerning their experiences in maintaining the AN/SRC-20, 21. The most frequently occurring maintenance tasks were those involving operational checks and adjustments. The test equipments used most frequently were the AN/URM-43C RF Wattmeter and the AN/USM-116 Electronic Multimeter. The specific equipment maintenance task causing the most difficulty was alignment of the AN/URC-9. There were also some problems concerning the use of the Technical Manual, lubrication, and test equipment. (Author)
AD-713 090 HC$3.00 MF$0.65

LEARNED-CENTERED INSTRUCTION (LCI): VOLUME VII. EVALUATION OF THE LCI APPROACH.
Final rept. 1 Jul 68-30 Sep 69,
Applied Science Associates Inc Valencia Pa
William J. Pieper, Robert W. Swezey, and Horace H. Valverde. Feb 70, 102p Rept no. ASA-34-1692-1 AFHRL-TR-70-1
Contract F33615-68-C-1692
See also Volume 6, AD-702 521

Descriptors: (*Programmed instruction, Tactical weapons), (*Air Force training, Effectiveness), Teaching methods, Job analysis, Performance (Human), Electronic technicians, Maintenance personnel, Jet fighters, Cost effectiveness, Experimental design.
Identifiers: *Learner centered instruction, F-111 aircraft, F-111A aircraft, Evaluation.

An evaluation of the learner centered instruction (LCI) approach to training was conducted by comparing the LCI F-111A weapons control systems mechanic/technician course with the conventional Air Force course for the same Air Force specialty code (AFSC) on the following dimensions: job performance of course graduates, man-hour and dollar costs of the two courses, and student acceptability and instructor problems for the LCI course. Measures of job performance included a job performance test, an Air Force practical test, the supervisors' ratings, and a substitute job knowledge test. The graduates were measured both at end-of-course and again after five months in the field at field follow-up. (Author)
AD-713 111 HC$3.00 MF$0.65

ACTIVITY LEVELS AND AIRCRAFT TYPES IN JET PROFICIENCY FLYING (CRT) AT NALF MONTEREY - DATA ACQUISITION AT FOUR HOURS PER MONTH IN THE T-1A AIRPLANE.
Interim technical rept. no. 1,
Naval Postgraduate School Monterey Calif
David A. Schrady. Sep 70, 83p Rept no. NPS-55So0091A

Descriptors: (*Pilots, *Training), Performance (Human), Jet training planes, Flight testing, Combat readiness.
Identifiers: T-1A aircraft, T-1 aircraft.

Methods were developed for the collection of data with respect to the knowledge, skill, and satisfaction of aviators in combat readiness training (CRT). The methods are described and data pertaining to aviators flying the T-1A aircraft at the rate of forty-eight hours per year is given. (Author)
AD-713 115 HC$3.00 MF$0.65

AN EVALUATION OF FITNESS REPORTS SCALES.
Technical rept.,
Naval Postgraduate School Monterey Calif
William H. Githens, and Lynn A. Lacey. 15 Jul 70, 17p Rept no. NPS-62GH0071A

Descriptors: (*Officer personnel, Leadership), (*Naval personnel, Questionnaires), Performance (Human), Measurement, Personality, Test construction (Psychology), Behavior, Statistical analysis, Reliability.
Identifiers: *Fitness reports, Evaluation, Peer ratings, Rating scales.

A sample of convenience was obtained in which 15 officers anonymously completed fitness reports on each other. Fitness report scales were examined to determine their quality based on the statistical considerations of a 'discrimination' and 'disagreement' index. The spread in scores (fitness marks) when a number of judges rated one individual was compared with that when an average judge rates a number of individuals. Generalizing from the study is limited by the size and nature of the sample. The study demonstrates a type of analysis that can be performed and the type of information that can be obtained by studies of this type. (Author)
AD-713 117 HC$3.00 MF$0.65

THE DEVELOPMENT OF AN ON-LINE SEARCHED COORDINATE INDEX FOR USE IN TEACHING AND RESEARCH.
Florida State Univ Tallahassee Computer-Assisted Instruction Center
For primary bibliographic entry see Field 5B.
AD-713 134 HC$3.00 MF$0.65

DEVELOPMENT OF PERFORMANCE EVALUATIVE MEASURES. INVESTIGATION INTO AND APPLICATION OF A FLEET POST-TRAINING PERFORMANCE EVALUATION SYSTEM.
Final technical rept.,
Applied Psychological Services Inc Wayne Pa Science Center
Arthur I. Siegel, and Philip J. Federman. Sep 70, 90p Rept no. APS-7071-2
Contract N00014-67-C-0107

Descriptors: (*Electronic technicians, Naval training), (*Maintenance personnel, Performance (Human)), (*Naval training, Effectiveness), Psychometrics, Feedback, Test methods, Reliability, Personnel management, Standards, Statistical analysis, Data processing systems, Programming (Computers), Job analysis, Manpower studies.
Identifiers: Evaluation.

Development and demonstration was attempted of an empirically rooted method, based on a sound measurement foundation, for providing feedback on the technical proficiency of Navy electronic maintenance personnel. The method relied largely on a personnel reliability index, modeled after an equipment reliability index. Specifically, the personnel reliability index is based on the compounding of probability of successful performance values for each of eight factorial derived electronic job dimensions. A second instrument, based on a Guttman scaled check list and which yields an absolute measure of performance was also administered and comparisons of the findings which resulted from the application of the two instruments are presented. (Author)
AD-713 192 HC$3.00 MF$0.65

AN ANALYSIS OF THE GEOGRAPHIC AND SOCIO-ECONOMIC ORIGINS OF THE 1969-70 CLASS OF THE COMMAND AND GENERAL STAFF COLLEGE,
Army Command and General Staff Coll Fort Leavenworth Kans
M. L. Little. 1970, 83p

Descriptors: (*Army personnel, Background), (*Officer personnel, Predictions), Questionnaires, Reviews, Statistical processes, Factor analysis, Selection, Motivation, Sociometrics, Economics, Religion, Political science, Correlation techniques, Accuracy.
Identifiers: Geographic origins, Socioeconomic status, Family relations.

The document reports on a study which tested the correctness of the following hypotheses: The Army leaders of the future will come from predominantly small town, lower-middle class, protestant homes; a disproportionate number, when compared with the US population distribution, will have Southern affiliations, and the majority will consider themselves politically conversative. The amount of correctness, as indicated by the results, is discussed. (Author)
AD-713 376 HC$3.00 MF$0.65

A STUDY OF DATA INPUT PROBLEMS WITHIN THE ARMY PERSONNEL INFORMATION SYSTEM,
Army Command and General Staff Coll Fort Leavenworth Kans
Bobby B. Simmons. Jun 70, 43p

Descriptors: (*Personnel management, Army), (*Data processing systems, Personnel management), Information retrieval, Automation, Reviews, Analysis, Marine Corps, Optical scanning, Management engineering, Systems engineering, Mathematical logic, Coding, Input-output devices.
Identifiers: Recommendations.

The document investigates data input problems within the Army's personnel information system. In connection with this, an analysis of the United States Marine Corps manpower management system has been made. Based upon the research findings, it is evident that the proper utilization of source data automation is of extreme importance in support of the total manpower management area of the Army personnel information system. This is especially true if the basic philosophies and con-

cepts which underie the automatic techniques being applied by Department of the Army are to be adhered to. (Author)
AD-713 379 HC$3.00 MF$0.65

A SIMULATION OF MANPOWER ALLOCATION POLICIES AT A MAINTENANCE DEPOT.
Technical rept.,
Florida Univ Gainesville Dept of Industrial and Systems Engineering
J. F. Burns, and J. C. Downey. Jun 70, 116p* Rept no. THEMIS-UF-TR-44 AROD-T-1:61
Contract DAHC04-68-C-0002

Descriptors: (*Manpower, Optimization), (*Personnel management, Mathematical models), (*Supply depots, Maintenance personnel), Simulation, Maintenance, Industrial relations, Management planning, Systems engineering, Cost effectiveness, Programming (Computers), Job analysis, Flow charting.
Identifiers: Policymaking, *Manpower allocation models, Management information systems, Themis project, Dynamo 2 programming language.

A study is reported of the dynamic nature of manpower allocation at a military maintenance depot. The investigation was simulated using some of the basic principles of industrial dynamics. DYNAMO 2 (DYNAmic MOdels) is used as the simulation language. The results of the investigation indicate that, within the given organization, manpower planning and allocation are related to meeting schedule demands and maintaining reasonable levels of cost in producing a product or service. This report also shows that the industrial dynamics technique can be utilized effectively to present various alternatives in manpower planning to management. The basic structure of the model presented may be adapted to a variety of military and industrial systems. (Author)
AD-713 389 HC$3.00 MF$0.65

DEVICE-TASK FIDELITY AND TRANSFER OF TRAINING: AIRCRAFT COCKPIT PROCEDURES TRAINING.
Technical rept.,
Human Resources Research Organization Alexandria Va
Wallace W. Prophet, and H. Alton Boyd. Jul 70, 55p Rept no. HUMRRO-TR-70-10
Contract DAHC19-70-C-0012

Descriptors: (*Training devices, Effectiveness), (*Cockpits, *Army training), Transfer of training, Flight simulators, Army aircraft.
Identifiers: *Pilot training.

The objective of the research was to evaluate the training effectiveness of two cockpit procedures training devices, differing greatly in their physical fidelity (and, consequently, cost), in the teaching of ground cockpit procedures for a twin-engine, turboprop, fixed wing aircraft. One group of students received training in cockpit procedures in a relatively expensive, sophisticated, high-fidelity, computerized cockpit procedures trainer, while another group were trained in an inexpensive, low-fidelity mockup of the aircraft cockpit. Their subsequent performance in the actual aircraft was compared with that of a control group who received all of their procedures training in the aircraft. Results indicated that both training devices produced significant transfer of training, in terms of error and time reduction, in performance in the actual aircraft. There were no significant differences in training effectiveness of the two devices, in spite of their great differences in physical fidelity and cost. Implications for the design of procedures training devices and associated training programs are discussed. (Author)
AD-713 433 HC$3.00 MF$0.65

THE IMPROVEMENT OF SELECTION TO PERSONNELMAN 'A' SCHOOL.
Technical bulletin,
Naval Personnel and Training Research Lab San Diego Calif
Patricia J. Thomas. Oct 70, 44p Rept no. STB-71-3

Descriptors: (*Personnel management, *Aptitude tests), (*Naval personnel, Selection), (*Performance (Human), Mathematical prediction), Attitudes, Personality tests, Memory, Teaching methods, Statistical analysis, Naval training.
Identifiers: *Personnel men, Enlisted personnel, Vocational interest inventory, Ratings.

The personnelman (PN) represents a major point of contact between the Navy and its enlisted men. The attitude the PN projects while performing his duties is believed to have an effect upon his serviceman-client's satisfaction with the Navy and subsequent reenlistment decision. Since all rated personnelmen must attend 'A' school, upgrading the performance of PN's can begin at the school selection point. Experimental administration of several tests of intermediate memory ability, the Navy vocational interest inventory (NVII), a peer rating, and an instructor's rating, was carried out at three PN 'A' schools. The Final School Grade (FSG) of each student was used as a criterion. In addition, the efficacy of the NVII for predicting the performance of rated PN's in the fleet was investigated. (Author)
AD-713 481 HC$3.00 MF$0.65

A MANPOWER DELIVERY SYSTEM: IMPLICATIONS FOR CURRICULUM DEVELOPMENT,
Human Resources Research Organization Alexandria Va
Robert G. Smith, Jr.. Jun 70, 11p* Rept no. HUMRRO professional paper-19-70
Presented at the Invitation Conference on Curriculum Development and Vocational Education, Minneapolis, Minnesota, Mar 70.

Descriptors: (*Manpower, Industrial relations), (*Personnel management, Mathematical models), Abundance, Industrial training, Job analysis, Systems engineering, Programmed instruction, Management planning, Factor analysis, Data processing systems.
Identifiers: Vocational guidance.

A simplified and abstract model of a manpower delivery system is presented. The relationships among the functions of occupational demands, guidance activities, placement work, occupational barriers, and interests of the job-seeker are discussed. The model points out to educational and training planners the principal aspects to consider when conducting a system analysis for vocational or professional education. (Author)
AD-713 499 HC$3.00 MF$0.65

THE UTILITY OF OER WORD PICTURES AS DISCRIMINATORS,
Air Force Human Resources Lab Lackland AFB Tex Personnel Research Div
Harold S. Coyle, Jr., and Charles D. Gorman. Jul 70, 17p AFHRL-TR-70-23

Descriptors: (*Personnel management, Reports), (*Officer personnel, Effectiveness), (*Performance (Human), Reports), Test methods, Reliability, Reviews, Statistical processes, Pattern recognition, Correlation techniques, Errors.
Identifiers: *Officer effectiveness reports, Promotions, Judges, Word pictures.

The document is concerned with a trend of Air Force officer effectiveness reports which has given problems. The overall numerical ratings assigned to evaluate performance have become questioned as effective criteria for discriminating individual performance for promotion and special assignment purposes. The main goal of the study was to see if the word picture portion of the officer effectiveness report can be used to discriminate performance. Within each set of word pictures, average correlations were computed for each group of ten judges to assess interjudge reliability. Rank order statistics were computed for differing numbers of judges from the ten from each group to assess whether optimum reliability would occur with fewer than ten judges. A composite rank order for each set was computed by averaging the rankings across each word picture. The composite rank orders were correlated with the actual criteria ordering. The question is raised as to whether word descriptions can be used as performance discriminators. (Author)
AD-713 608 HC$3.00 MF$0.65

FISCAL YEAR 1971 WORK PROGRAM FOR THE DEPARTMENT OF THE ARMY RESEARCH AND DEVELOPMENT IN TRAINING, MOTIVATION, AND LEADERSHIP.
Human Resources Research Organization Alexandria Va

Sep 70, 124p
Contract DAHC-19-70-C-0012
See also AD-701 239.

Descriptors: (*Human engineering, Army research), (*Army training, Personnel management), (*Performance (Human), Effectiveness), Research program administration, Teaching methods, Training devices, Motivation, Leadership, Factor analysis, Group dynamics, Control, Classification, Programming (Computers), Management planning, Reviews.
Identifiers: Computer assisted instruction.

Activities in the human resources work program for the Department of the Army for FY 1971 have been grouped into six major research areas. These groupings, although not definitive or mutually exclusive, serve to indicate the nature of HumRRO work in relation to needs arising in major Army activities; they also serve to emphasize the interrelationships among HumRRO studies. A tabular summary of the work program showing the location, category, and amount of effort in each research area is presented. (Author)
AD-713 626 HC$3.00 MF$0.65

COMPARISON OF SELF-MOTIVATED AIR FORCE ENLISTERS WITH DRAFT-MOTIVATED ENLISTEES,
Air Force Human Resources Lab Brooks AFB Tex
Lonnie D. Valentine, Jr., and Bart M. Vitola. Jul 70, 27p Rept no. AFHRL-TR-70-26

Descriptors: (*Air Force personnel, Background), (*Motivation, Statistical data), (*Recruiting, Motivation), Reviews, Education, Sociometrics, Economics, Attitudes, Achievement tests, Questionnaires.
Identifiers: Selective service, Voluntary enlistments, Socioeconomic status, Self motivated enlistment.

Since World War 2, the Air Force has relied upon voluntary enlistments to maintain its force structure, but, it is recognized that many airmen are motivated to enlist by the prospect of being drafted for the Army. As the services move toward an all-volunteer force, it is important to understand the impact of such a move on the characteristics of Air Force input. With this objective, two groups of basic trainees were defined in terms of their draft vulnerability at the time of enlistment and their stated attitude toward enlistment in the absence of a draft. These groups, identified as self-motivated and draft-motivated enlistees, were compared on a number of dimensions. From comparative data derived from the subjects' responses to a biographical survey and an attitude survey, statistically significant differences are noted between the two groups. The data suggest that military service can be made more attractive to draft-motivated enlistees by restructuring the personnel system in some regards. (Author)
AD-713 638 HC$3.00 MF$0.65

PRINTED-CIRCUIT-BOARD SOLDERING TRAINING FOR GROUP IV PERSONNEL.
Research rept.,
Naval Personnel and Training Research Lab San Diego Calif
E. A. Hooprich, and E. W. Matlock. Oct 70, 40p
Rept no. SRR-71-11

Descriptors: (*Printed circuits, Soldering), (*Soldering, *Teaching methods), Naval training, Correlation techniques, Personnel management, Aptitude tests, Performance (Human), Effectiveness.
Identifiers: Marginal personnel, Group 4 personnel.

One purpose of the research investigation was to determine whether or not Mental Group 4 personnel can be taught, within an acceptable period of training, to perform adequately an exacting, technical Navy skill such as printed-circuit-board soldering. A related purpose was to compare two methods for accomplishing such training. (Author)
AD-713 639 HC$3.00 MF$0.65

THE SUPPLY OF AIR FORCE VOLUNTEERS,
Rand Corp Santa Monica Calif
A. A. Cook, Jr. Sep 70, 50p Rept no. RM-6361-PR
Contract F44620-67-C-0045

Descriptors: (*Air Force personnel, Statistical data), (*Recruiting, Mathematical models), Mathematical prediction, Motivation, Industrial training, Wages, Quality control, Statistical distributions, Costs, Job analysis.
Identifiers: Voluntary enlistments, Selective service, Draft motivated enlistment, Unemployment.

The document analyzes the effects of reduced draft calls and a changing economy on the quantity and quality of airmen volunteers following the SEA war. A model of airmen supply is developed in the context of occupational choice. The supply curve resulting from the model is empirically estimated using quarterly data, which consider changes in expected military and civilian earnings, unemployment, and the diverse effects of draft pressure. The elasticity of supply of volunteers with respect to pay and to draft pressure is determined. The number of volunteers for alternative scenarios is demonstrated, as well as the cost of obtaining various levels of airmen accessions for different scenarios. (Author)
AD-713 703 HC$3.00 MF$0.65

ESTIMATING THE QUALITY OF AIR FORCE VOLUNTEERS,
Rand Corp Santa Monica Calif
A. A. Cook, Jr., and J. P. White. Sep 70, 51p Rept no. RM-6360-PR
Contract F44620-67-C-0045

Descriptors: (*Air Force personnel, Quality control), (*Recruiting, Personnel management), Aptitude tests, Standards, Mathematical models, Job analysis, Statistical processes, Statistical distributions, Approximation (Mathematics), Wages, Attitudes.
Identifiers: Voluntary enlistments, Armed Forces qualification test, Economic models.

The description is given of an analytical model of airmen supply in the context of occupational choice. The model is used to examine the distribution of volunteers in terms of the Armed forces qualification test scores of new airmen over time. By considering the manner in which the Air Force creams the volunteer population to obtain its recruits, the model can be used to explain the variation in the quality of recruits under different situations. It provides the Air Force with a device for controlling enlistee quality, and underscores the validity of the creaming process. (Author)
AD-713 704 HC$3.00 MF$0.65

RATIONAL VS. EMPIRICAL APPROACHES TO JOB/TASK DESCRIPTIONS FOR COBOL PROGRAMMERS,
Human Resources Research Organization Alexandria Va
Felix F. Kopstein. Jun 70, 16p Rept no. HUMRRO professional paper-18-70
Contract DAHC19-70-C-0012
Presented at the Annual Conference of the Special Interest Group, Computer Personnal Research of the Association for Computing Machinery (7th), Chicago Univ., Ill., Jun 69.

Descriptors: (*Programmers, Training), (*Programming (Computers), Job analysis), Instruction manuals, Army personnel, Programming languages.
Identifiers: COBOL.

The purpose of the paper is to contrast empirical approaches deriving from job analysis and rational approaches deriving from task/equipment analysis, and to suggest the differences in the information to be gained from each. Job analysis establishes what exactly a representative sample of incumbents do on the job. Task/equipment analysis deduces the behavioral requirements for its operators and maintainers from the functional characteristics of equipment, or from task situations that do not yet exist in actuality. The purely empirical approach develops a set of behavioral capabilities together with associated frequencies of occurrence, but cannot guarantee that the required set of behavioral capabilities will be exhaustively enumerated. The purely rational approach will develop an exhaustive set of behavioral capabilities requisite for certain job or task constellations, but will provide no good way of establishing their probabilities of occurrence. Therefore, a combined approach seems desirable. It is illustrated in the context of a COBOL programmer's job. The use of data from combined rational and empirical job/task analyses for statistical models of job families is discussed. The uses of these models in training design is also discussed.
AD-713 716 HC$3.00 MF$0.65

SYSTEMATIC APPROACHES FOR IDENTIFYING AND ORGANIZING CONTENT FOR TRAINING PROGRAMS,
Human Resources Research Organization Alexandria Va
Harry L. Ammerman. Jun 70, 19p Rept no. HUMRRO professional paper-20-70
Presented at the Invitational Conference for Curriculum Development and Vocational Education, Minneapolis, Minn., Mar 70.

Descriptors: (*Military training, Advanced planning), Teaching methods, Job analysis, Factor analysis, Word association, Research program administration, Systems engineering, Effectiveness.
Identifiers: *Technical education, Concepts, *Curriculum development.

The report concentrates on two aspects in the development of curriculums for technical training: The identification of curriculum content for specific courses of study, and the organization of such content in training programs. Use of a word-association technique in a military radar maintenance course indicated that some procedural questions need exploring to make this approach an operational tool of curriculum designers, but its potential usefulness warrants research. Effort in making instructional decisions can be directed toward rigorous and complete determination of performance requirements. (Author)
AD-713 719 HC$3.00 MF$0.65

AUTOMATION OF PERSONNEL PERFORMANCE EVALUATION DATA: A STUDY.
Research rept.,
System Development Corp Santa Monica Calif
R. J. Cooper. 30 Apr 69. 70p Rept no. SDC-TM-L-4217/000/00 NAVPERS-PRD-PRR-69-1
Contract N00022-68-C-0114

Descriptors: (*Personnel management, Data processing systems), (*Naval personnel, Personnel management), Records, Automation, Feasibility studies, Performance (Human), Officer personnel.
Identifiers: *Navy performance evaluation systems, *Personnel information systems.

To assist the Bureau of Naval Personnel in planning for automated officer and enlisted performance evaluation systems, the study had as its phases: survey of fifteen selected organizations for related experience in automating such systems, analysis of the current Navy performance evaluation systems, feasibility study of current and projected hardware and software, and recommendations for Navy planning. (Author)
AD-713 729 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: HAND GRENADES.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 19F.
AD-713 754 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGE, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: DEMOLITIONS AND BOOBYTRAPS.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 19A.
AD-713 755 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: GRENADE LAUNCHER, 40MM, M79.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 19F.
AD-713 756 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS OF THE INFANTRY RIFLE SQUAD LEADER: PHYSICAL CONDITIONING.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 15G.
AD-713 757 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: OBSERVATION, COMBAT INTELLIGENCE AND REPORTING.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 15G.
AD-713 758 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: HUMAN MAINTENANCE UNDER CAMPAIGN CONDITIONS.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 15G.
AD-713 759 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: ANTITANK WEAPON, 66-MM HEAT ROCKET, M72.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 19G.
AD-713 789 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: DEFENSIVE OPERATIONS.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 15G.
AD-713 791 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: COVER, CONCEALMENT, AND CAMOUFLAGE.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 15G.
AD-713 792 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: RIFLE, 7.62-MM, M14A1.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 19F.
AD-713 793 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: MISSION, ORGANIZATION, AND GENERAL OPERATION OF THE RIFLE SQUAD AND PLATOON.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 15G.
AD-713 800 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: PORTABLE FLAMETHROWERS.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 19A.
AD-713 801 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: MESSENGER COMMUNICATION.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 15G.
AD-713 802 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: PROTECTION AGAINST CBR WARFARE AND NUCLEAR EXPLOSIONS.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 15G.
AD-713 803 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER. SELF-AID, FIRST AID AND EVACUATION.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 6E.
AD-713 805 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: RETROGADE OPERATIONS.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 15G.
AD-713 806 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: ANTI-PERSONNEL MINE M18A1 (CLAYMORE).
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 19F.
AD-713 808 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: ARMORED PERSONNEL CARRIER.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 19C.
AD-713 809 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: EMPLACEMENTS, SHELTERS, OBSTACLES, AND FIELDS OF FIRE.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 15G.
AD-713 810 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: MACHINEGUN, 7.62-MM, M60.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 19F.
AD-713 811 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: MINES, ANTITANK AND ANTIPERSONNEL, AND WARNING AND ILLUMINATING DEVICES.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 19A.
AD-713 812 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: MOUNTED AND DISMOUNTED PLATOON COMBAT FORMATIONS.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 15G.
AD-713 813 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: PATROLLING.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 15G.
AD-713 814 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: PROTECTION AGAINST MINES, BOOBYTRAPS, AND WARNING AND ILLUMINATING DEVICES.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 19A.
AD-713 815 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: RADIO COMMUNICATION.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 17B.
AD-713 816 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: RIFLE, 5.56MM, M16.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 19F.
AD-713 821 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADERS: TACTICAL MOVEMENT.
Human Resources Research Organization Alexandria Va
For primary bibliographic entry see Field 15G.
AD-713 823 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: TECHNIQUE OF FIRE OF THE RIFLE SQUAD.
Human Resources Research Organization Alexandria Va
For primary bibliographic entry see Field 19F.
AD-713 824 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: OFFENSIVE OPERATIONS.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 15G.
AD-713 827 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: WIRE COMMUNICATION.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 17B.
AD-713 828 HC$3.00 MF$0.65

PERSONALITY CHARACTERISTICS (EPPS) OF ANTARCTIC VOLUNTEERS.
Navy Medical Neuropsychiatric Research Unit, San Diego, Calif.
Kenneth A. Ford, and E. K. Eric Gunderson. Dec 62, 17p NMNRU-62-18
Distribution Limitation now Removed.

Descriptors: (*Personality, Naval research), (*Personnel, Antarctic regions), Stress (Psychology), Civilian personnel, Naval personnel, Personality tests, Confinement (Psychology), Motivation.
Identifiers: Volunteers, EPPS (Edwards personnel preference schedule), Interpersonal relations, Edwards personal preference schedules.

The nature and intensity of psychological needs in members of work and living groups, particularly in situations of long term isolation and confinement, may significantly affect individual adjustment, group cooperation, and productivity. The study is concerned with personality characteristics, as measured by the Edwards Personal Preference Schedule (EPPS), of two groups of volunteers for assignments which involved unusual hazard, hardship, and prolong isolation and confinement. These volunteers were civilian scientists and technicians and Navy support personnel stationed

in Antarctica during the International Geophysical Year 1957a58. (Author)
AD-814 862 HC$3.00 MF$0.65

MINORITIES IN PLANNING AND URBAN AFFAIRS.
Project completion rept.
East-West Gateway Coordinating Council, East St. Louis, Ill.

Sep 70, 12p

Descriptors: (*Students, Performance evaluation), (*Urban planning, Programmed instruction), Personnel development, Leadership, Supervision, Output, Effectiveness, Missouri, Illinois.
Identifiers: East West gateway area, Minority groups.

A review is given of the accomplishments of minority group students who were given training in urban planning and management in an East West gateway area project.
PB-194 879 HC$3.00 MF$0.65

ANALYSIS OF INFORMATION TO BE INCLUDED IN DRIVER LICENSE FILE.
Research Triangle Inst., Durham, N.C. Operations Research and Economics Div.
For primary bibliographic entry see Field 5D.
PB-194 977 HC$3.00 MF$0.65

GUIDELINES FOR INFORMATION TO BE INCLUDED IN DRIVER LICENSE FILE.
Research Triangle Inst., Durham, N.C. Operations Research and Economics Div.
For primary bibliographic entry see Field 5D.
PB-194 978 HC$3.00 MF$0.65

INITIAL DRIVER LICENSE QUESTIONNAIRE SUMMARY.
Research Triangle Inst., Durham, N.C. Operations Research and Economics Div.
For primary bibliographic entry see Field 5D.
PB-194 979 HC$3.00 MF$0.65

BIBLIOGRAPHY ON DRIVER LICENSING.
Research Triangle Inst., Durham, N.C. Operations Research and Economics Div.
For primary bibliographic entry see Field 5D.
PB-194 980 HC$3.00 MF$0.65

MANPOWER AND TECHNOLOGY IN BITUMINOUS COAL MINING: 1956-70.
Indiana Univ., Bloomington.
For primary bibliographic entry see Field 8I.
PB-195 004 HC$3.00 MF$0.65

HUMAN RESOURCES MANAGEMENT SYSTEM AND PROGRAM INITIATION. MANUAL A-MODEL 1.1.
Final rept.
Ozarks Regional Commission.

Sep 70, 93p
Prepared in cooperation with United Dynamics, Inc.

Descriptors: (*Economic development, *Regional planning), (*Income, Management planning), (*Manpower utilization, *Manuals), Mathematical models, Flow charts, Classifications, Computer programs, Job analysis, Coding, Data processing, Cost analysis, Arkansas, Kansas, Missouri, Oklahoma.
Identifiers: *Ozarks region, *Human resources.

The human resources management system is one of the component subsystems for economic development. The HRMS is designed as a comprehensive system or framework to assist the Commission allocate its funds towards maximizing the economic growth opportunities in the region. The component modules aid in identifying, recruiting, and referring people to jobs and/or training opportunities within their immediate geographic area, as well as providing a framework for community evaluation and improvement. The HRMS is comprised of six reports. The first of which isManual A. The manual is divided into two major parts; part one presents the overall HRM System design and concepts and data processing applications. Part two deals with the implementation module of the HRMS. The purposes of part two are to identify and define the groups within the region and community who may lend assistance in improving factors affecting industrial development, including the labor force. (Author)
PB-195 033 HC$3.00 MF$0.65

HUMAN RESOURCES MANAGEMENT SYSTEM. COMMUNITY EVALUATION MODEL. MANUAL B-MODEL 1.2.
Final rept.
Ozarks Regional Commission.

Sep 70, 85p
Prepared in cooperation with United Dynamics, Inc. See also Manual A, PB-195 033.

Descriptors: (*Economic development, *Regional planning), (*Communities, Evaluation), (*Manpower utilization, *Manuals), Mathematical models, Industrial readiness, Labor relations, Factor analysis, Statistical processes, Management, Cost analysis, Classifications, Arkansas, Kansas, Missouri, Oklahoma.
Identifiers: *Ozarks region, *Human resources.

Manual B is the second volume in a 6 part report. It presents a model which measures and assists in determining the degree of community readiness and the potential for manufacturing growth. This phase is basic to planning because of the direct relationship of manpower development and utilization with community potential for growth. The document considers full development and utilization of human resources as dependent upon the total business climate. When a community begins an intensive effort to correct its deficiencies, the HRMS should be included.
PB-195 034 HC$3.00 MF$0.65

HUMAN RESOURCES MANAGEMENT SYSTEM. LABOR AVAILABILITY SURVEY. JOB AVAILABILITY SURVEY. LABOR/JOB MATCHING. MANUAL C-MODELS 1.3, 1.4, 1.5.
Final rept.
Ozarks Regional Commission.

Sep 70, 147p
Prepared in cooperation with United Dynamics, Inc. See also manual B, PB-195 034.

Descriptors: (*Economic development, *Regional planning), (*Labor relations, *Surveys), (*Manpower utilization, *Manuals), Mathematical models, Recruiting, Lead time, Statistical distributions, Data acquisition, Questionnaires, Factor analysis, Computer programming, Arkansas, Kansas, Missouri, Oklahoma.
Identifiers: *Ozarks region, *Human resources, Job availability, Job matching systems.

Manual C, the third volume in a 6 part series, presents a field tested technique for identifying and recruiting manpower. The value and use in working with industrial prospects is discussed. The model includes an outline of procedures to be used in the collection of labor availability data and utilizing the capabilities of a computer. The lists of respondents from the labor survey may be used as a tool in recruiting for training programs and for industrial jobs. (Author)
PB-195 035 HC$3.00 MF$0.65

HUMAN RESOURCES MANAGEMENT SYSTEM. OCCUPATIONAL EDUCATION MODEL. MANUAL D, MODEL 1.6.
Final rept.
Ozarks Regional Commission.

Sep 70, 111p
Prepared in cooperation with United Dynamics, Inc. See also Manual C, PB-195 035.

Descriptors: (*Economic development, *Regional planning), (*Industrial training, *Programmed instruction), (*Manpower utilization, *Manuals), Mathematical models, Flow charts, Management planning, Computer programming, Coding, Budgeting, Project management, Costs, Arkansas, Kansas, Missouri, Oklahoma.
Identifiers: *Ozarks region, *Human resources.

Manual D, the fourth in a 6 volume series, presents a model which compiles several proven methods for organizing, planning, budgeting, and executing programs of occupational education. It also details instructions on how to conduct a new industry training program. A major part of this model deals with the development of an occupational education data base for the HRMS. A budget projection plan for the Region is given and is based upon the number of jobs established as a goal within a five year period. (Author)
PB-195 036 HC$3.00 MF$0.65

HUMAN RESOURCES MANAGEMENT SYSTEM. PROJECT EVALUATION. MANUAL E, MODEL 1.7.
Final rept.
Ozarks Regional Commission.

Sep 70, 33p
Prepared in cooperation with United Dynamics, Inc. See also Manual D, PB-195 036.

Descriptors: (*Economic development, *Regional planning), (*Industrial training, Benefit cost analysis), (*Manpower utilization, *Manuals), Mathematical models, Evaluation, Formulas (Mathematics), Investments, Education, Arkansas, Kansas, Missouri, Oklahoma.
Identifiers: *Ozarks region, *Human resources.

Manual E is the fifth in a 6 volume series. It presents a model which describes the development and use of three basic evaluation formulas for projects in occupational education. This program provides a cost-benefit analytical technique suitable for considering alternative investments in the region. (Author)
PB-195 037 HC$3.00 MF$0.65

HUMAN RESOURCES MANAGEMENT SYSTEM. PROJECT FINAL REPORT. MANUAL F.
Ozarks Regional Commission.

Sep 70, 126p
Prepared in cooperation with United Dynamics, Inc. See also Manual E, PB-195 037.

Descriptors: (*Economic development, *Regional planning), (*Projects, Evaluation), (*Manpower utilization, *Technical reports), Mathematical models, Management, Correlation techniques, Classifications, Impact, Statistical analysis, Oklahoma, Arkansas, Kansas, Missouri.
Identifiers: *Ozarks region, *Human resources.

The volume contains the final report in a 6 volume series. It presents a chronological overview of the development of the Human Resources Management System, a record of the field activities, recommendations to the ORC, and project evaluation. (Author)
PB-195 038 HC$3.00 MF$0.65

A PERSONNEL MANAGEMENT INFORMATION SYSTEM.
Research rept.,

Georgia Inst. of Tech., Atlanta. School of Information and Computer Science.
Robert Bruce Bauman. 1970, 42p* GITIS-70-06
Grant NSF-GN-655

Descriptors: (*Personnel management, Information systems), (*Data storage, Industrial plants), Records management, Computer programming, Flow charts, Systems engineering, Programming languages, Design.
Identifiers: PDP 8 computers.

The paper presents an original design for a computer-based personnel management information system. Constraints upon the design include the use of a conversational user language implemented on a PDP-8 computer system for companies with less than five hundred employees. A general discussion of the implementation phases for this design concludes the paper. (Author)
PB-195 136 HC$3.00 MF$0.65

THE AUDIOGRAPHIC LEARNING FACILITY: OBJECTIVES AND DESIGN.
Research rept.,
Georgia Inst. of Tech., Atlanta. School of Information and Computer Science.
Vladimir Slamecka, and Alton P. Jensen. 1970, 48p* GITIS-70-08
Grant NSF-GN-655

Descriptors: (*Computer systems programs, Education), (*Information retrieval, Remote control), Learning, Telephone systems, Command and control, Random access computer storage, Tape recording.
Identifiers: *Audiographic learning facility, PDP 8/1 computers, Computer aided instruction, Man computer dialogs.

The audiographic learning facility is a pilot system for remote conversational instruction and learning. The learning materials, stored and reproduced in the form of graphically supported narrative, lecture/blackboard presentation, are modularly structured into learning units which are randomly accessible via telephone from student stations. The report describes the objectives pursued by the development of the facility; its design characteristics (learning materials, hardware, and control software); and its use for learning in conversational mode, replacing live classroom instruction in undergraduate and graduate education. (Author)
PB-195 137 HC$3.00 MF$0.65

COMPUTER SOFTWARE CHARACTERISTICS OF THE AUDIOGRAPHIC LEARNING FACILITY,
Georgia Inst. of Tech., Atlanta. School of Information and Computer Science.
For primary bibliographic entry see Field 9B.
PB-195 157 HC$3.00 MF$0.65

EMPLOYMENT STUDY INSTRUCTION MANUAL.
City-County Planning Commission, Rockford, Ill.

Dec 69, 33p RWCCPC-68-1

Descriptors: (*Employment, *Surveys), (*Job analysis, *Indiana), (*Methodology, *Manuals), Data acquisition, Sources, Personnel, Classifications, Unemployment, Coding, Information systems, Records, Punched cards, Automation.
Identifiers: Rockford (Illinois), Winnebago County (Illinois).

The manual presents guidelines for conducting an employment study. It contains the step by step procedures needed to determine the types of occupations and the number of employees involved in each occupation, in Winnebago County, Illinois. The study methodologies have been developed in such a manner that electronic data processing can be used in data manipulation. (Author)
PB-195 191 HC$3.00 MF$0.65

A STUDY OF COMFORT, HEALTH AND LEARNING IN SCHOOLS WITH DIFFERING THERMAL CONDITIONS.
Dunlap and Associates, Inc., Darien, Conn.
For primary bibliographic entry see Field 6N.
PB-195 257 HC$3.00 MF$0.65

5J. Psychology (Individual and Group Behavior)

PERFORMANCE DECREMENT AS A FUNCTION OF SEVEN DAYS OF BEDREST.
Final rept. Oct-Nov 69,
School of Aerospace Medicine Brooks AFB Tex
Ralph W. Trimble, and Charles S. Lessard. Sep 70, 11p Rept no. SAM-TR-70-56

Descriptors: (*Performance (Human), Attrition), (*Physical fitness, Responses), (*Fatigue (Physiology), Psychomotor tests), Adults, Males, Test methods, Air Force personnel, Theory, Time.
Identifiers: *Bedrest.

The hypothesis that performance decrements will occur as a function of 7 days of complete bedrest was tested in a study in which healthy, normal, young adult males served as subjects. Results indicate that longer periods of bedrest may be needed before any decrements become observable in this type of study. (Author)
AD-713 070 HC$3.00 MF$0.65

EFFECTS OF THE UNDERWATER ENVIRONMENT UPON WORK EFFICIENCY OF DIVERS.
Man Factors Inc San Diego Calif
For primary bibliographic entry see Field 6S.
AD-713 147 HC$3.00 MF$0.65

PARAMETERS OF HUMAN PATTERN PERCEPTION.
Semi-annual progress rept. no. 6, 18 Mar-18 Sep 70,
Texas Christian Univ Fort Worth Inst for the Study of Cognitive Systems
Selby H. Evans. 18 Oct 70, 31p
Contract DAAD05-68-C-0176
See also Semi-annual rept. no. 5, AD-705 466.

Descriptors: (*Pattern recognition, Performance (Human)), (*Perception, Scientific research), Multivariate analysis, Sequences, Learning, Mathematical models, Military requirements, Personnel management, Theory, Reports, Training, Culture.
Identifiers: Knowledge of results, Temporal context, Individual differences, Themis project.

The report is the sixth semi-annual progress report on a research program an parameters of human pattern perception. Empirical developments during this period have included: The successful application of multivariate techniques to the study of feature selection, and further specification of the effects of knowledge of results and temporal context on pattern recognition performance. Methodological and empirical results from the laboratory have been extended to the areas of individual difference testing and discrimination of polygraph recordings. (Author)
AD-713 185 HC$3.00 MF$0.65

REVERSALS OF PREFERENCE BETWEEN BIDS AND CHOICES IN GAMBLING DECISIONS,
Oregon Research Inst Eugene
Sarah Lichtenstein, and Paul Slovic. Oct 70, 31p* Rept no. Research Bull-Vol-10-7-70
Contract N00014-68-C-0431

Descriptors: (*Decision making, Game theory), (*Reaction (Psychology), Mathematical models), (*Performance (Human), Probability), Uncertainty, Behavior, Reliability, Psychometrics.
Identifiers: Gambling, Bidding theory, Choice making, Information processing (Psychology).

Subjects in 3 experiments chose their preferred bet from pairs of bets, and later bid for each bet separately. In each pair, one bet had a higher probability of winning (P bet); the other offered more to win (S bet). Bidding method (selling vs. buying) and payoff method (real-play vs. hourly wage) were varied. Results showed that when the P bet was chosen, the $ bet often received a higher bid. These inconsistencies are incompatible with risky decision models, but can be understood via information-processing considerations. (Author)
AD-713 215 HC$3.00 MF$0.65

THE NATURE OF THE EFFECT OF SET ON TACHISTOSCOPIC RECOGNITION.
Technical memo.,
Human Engineering Labs Aberdeen Proving Ground Md
Robert G. Pachella. Aug 70, 36p* Rept no. HEL-TM-21-70

Descriptors: (*Visual acuity, Decision making), (*Performance tests, Tachistoscopes), Set theory, Illusions, Analysis of variance, Performance (Human), Reaction (Psychology), Pattern recognition, Sensitivity, Human engineering, Army research.
Identifiers: *Perceptual set, Stimulus response analysis, Alternatives, *Tachistoscopic recognition.

Subjects were required to decide whether or not a briefly presented picture of a common object was the same as a specified alternative. The alternative was presented either before the stimulus exposure or after it. In experiment 1 the alternative was either the picture of an object or the name of an object. In experiment 2 the subjects were shown all of the stimulus pictures, for 10 seconds each, 24 hours prior to the experimental session. During the experimental session, the subjects were presented with name alternatives either before or after the stimulus flash. Results are discussed with regard to the questions of the nature and locus of the effect of set on tachistoscopic recognition.
AD-713 291 HC$3.00 MF$0.65

EEG CORRELATES OF REINFORCED BEHAVIORAL INHIBITION,
California Univ Los Angeles
For primary bibliographic entry see Field 6P.
AD-713 307

ELECTROCORTICAL RECRUITING RESPONSES DURING CLASSICAL CONDITIONING,
California Univ Los Angeles Brain Research Inst
For primary bibliographic entry see Field 6P.
AD-713 312

PERCEPTUAL DISCRIMINATION IN MONKEYS: RETROACTIVE VISUAL MASKING,
California Univ Los Angeles Brain Research Inst
For primary bibliographic entry see Field 6P.
AD-713 367

I PROMISE: MAGSAYSAY'S UNIQUE PSYOP 'DEFEATS' HUKS.
Army Command and General Staff Coll Fort Leavenworth Kans
For primary bibliographic entry see Field 15G.
AD-713 411 HC$3.00 MF$0.65

BRAIN ORGANIZATION AND BEHAVIOR.
California Univ Los Angeles Dept of Physiology
For primary bibliographic entry see Field 6P.
AD-713 470 HC$3.00 MF$0.65

SOCIAL STATUS VARIABLES IN THE MILITARY AND THEIR EFFECT ON EXPRESSING AGGRESSION,
Military Academy West Point N Y
John W. Baker, II. 1970, 9p

Descriptors: (*Behavior, Army research), (*Emotions, Theory), (*Performance (Human), Analysis), Performance tests, Test methods, Anxiety, Physiology, Army personnel, Reaction (Psychology), Social psychology, Analysis of variance.
Identifiers: Arousal, *Aggressiveness, Enlisted personnel.

The hypothesis that aggressive experiences reduce frustration as expressed by physiological (systolic blood pressure, heart rate, respiration and galvanic skin response) and psychological (anxiety) arousal was investigated by assessing differences in arousal achieved by the subject counteraggressing alone or through aggressive responses expressed with another person. Counter-aggression occurred through overt (apparent electric shock) and covert (abated) means and in the presence of a high status or low status instigator. (Author)
AD-713 507 HC$3.00 MF$0.65

ALTERATION OF TASTE QUALITIES THROUGH NATURAL PRODUCTS,
Army Natick Labs Mass
For primary bibliographic entry see Field 6P.
AD-713 510 HC$3.00 MF$0.65

ELECTROPHYSIOLOGICAL MEASURES OF CROSS-SENSORY INTERACTION IN THE CENTRAL NERVOUS SYSTEM,
Human Engineering Labs Aberdeen Proving Ground Md
For primary bibliographic entry see Field 6P.
AD-713 567 HC$3.00 MF$0.65

THE EFFECT OF UNDIFFERENTIATED MASS PUNISHMENT OF THE ATTRACTIVENESS OF THE REBEL,
Military Academy West Point N Y Office of Military Psychology and Leadership
William B. Seely. 1970, 15p*

Descriptors: (*Group dynamics, Military psychology), (*Behavior, Control systems), (*Applied psychology, Effectiveness), Social psychology, Performance (Human), Morale, Attitudes, Test methods, Questionnaires, Emotions.
Identifiers: *Group punishment.

The paper summarizes some of the social psychological research conducted in the area of mass punishments and related group factors, and describes a recent study investigating specific aspects of group dynamics occurring in a mass punishment situation. (Author)
AD-713 579 HC$3.00 MF$0.65

PHYSIOLOGICAL RESPONSES OF MEN DURING SLEEP DEPRIVATION,
Civil Aeromedical Inst Oklahoma City Okla
For primary bibliographic entry see Field 6P.
AD-713 590 HC$3.00 MF$0.65

EFFECTS OF ALCOHOL ON MEMORY AND ITS IMPLICATIONS FOR FLYING SAFETY,
School of Aerospace Medicine Brooks AFB Tex
For primary bibliographic entry see Field 6E.
AD-713 611

EFFECTS OF THALAMOCORTICAL ACTIVATION ON RECRUITING RESPONSES. II. PERIPHERAL AND CENTRAL NEURAL STIMULATION,
California Univ Los Angeles Brain Research Inst
For primary bibliographic entry see Field 6P.
AD-713 631

PSYCHOLOGISCHE ASPEKTE DER AUSBILDUNG VON PILOTEN (Psychological Aspects of Pilot Training),
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Bad Godesberg (West Germany)
K. Steininger. 1970, 9p Rept no. DFVLR-Sonderdruck-53
Text in German.
Availability: Pub. in Arbeit und Leistung, v24 n6 p2-8 1970. No copies furnished.

Descriptors: (*Pilots, Military training), (*Performance (Human), Predictions), Psychometrics, Stress (Psychology), Personnel management, Selection, West Germany.
Identifiers: Concepts.

From the results of experience in the selection and training of flying personnel comes the concept of an integrated personnel management system in which a continuous process is utilized. The document discusses the most important conditions for an integration of selection and training, with particular attention to psychological stresses involved.
AD-713 642

AN EVALUATION OF GUIDANCE IN LEARNING A MOTOR SKILL,
Human Factors Research Inc Santa Barbara Calif
C. H. Baker. 16 Jan 68, 11p
Contract N61339-66-C-0037
Availability: Pub. in Canadian Jnl. Psychology/Rev. Canadian Psychology, v22 n3 p217-227 1968.

Descriptors: (*Tracking, Teaching methods), (*Learning, Motor reactions), Training devices, Performance (Human), Performance tests, Retention, Time, Effectiveness, Analysis of variance, Test methods.
Identifiers: *Motor skills, Motor guidance, *Manual guidance, Tracking tasks.

The purpose of the experiment was to evaluate the efficacy of the guidance principle in helping one to learn a motor skill. There are numerous military situations in which training is extremely expensive, such as teaching the control of ground-to-ground missiles. If guidance is an effective aid to learning, then it would be a less expensive way to teach the student the needed amount of skill for performing tasks on the range, or more students could be trained at the same time. To evaluate the effectiveness of the guidance principle in learning a skill, subjects in a guidance condition received a total of 48 minutes of guidance, followed by 48 minutes of testing without guidance. A test was made six weeks later to determine the amount of skill which had been retained. (Author)
AD-713 682

THE ROLE OF NONSPECIFIC RETICULOTHALAMO-CORTICAL SYSTEMS IN EMOTION,
California Univ Los Angeles Brain Research Inst
For primary bibliographic entry see Field 6P.
AD-713 687

OF COMPUTERS AND SLEEP.
Navy Medical Neuropsychiatric Research Unit San Diego Calif
For primary bibliographic entry see Field 6P.
AD-713 730 HC$3.00 MF$0.65

ELECTROPHYSIOLOGICAL CORRELATES OF VISUAL PERCEPTUAL MASKING IN MONKEYS,
California Univ Los Angeles Brain Research Inst
For primary bibliographic entry see Field 6P.
AD-713 818

NAVAL RESEARCH REVIEWS, VOLUME XXIII, NUMBER 9,
Office of Naval Research Arlington Va
For primary bibliographic entry see Field 20M.
AD-713 838

PERSONALITY CHARACTERISTICS (EPPS) OF ANTARCTIC VOLUNTEERS,
Navy Medical Neuropsychiatric Research Unit, San Diego, Calif.
For primary bibliographic entry see Field 5I.
AD-814 862 HC$3.00 MF$0.65

PREDICTION OF SUBJECTIVE RESPONSE TO ROAD ROUGHNESS USING THE GENERAL MOTORS-MICHIGAN DEPARTMENT OF STATE HIGHWAYS RAPID TRAVEL PROFILOMETER.
Michigan Dept. of State Highways, Lansing.
For primary bibliographic entry see Field 13F.
PB-194 911 HC$3.00 MF$0.65

DEVELOPMENT OF INFORMATION REQUIREMENTS AND TRANSMISSION TECHNIQUES FOR HIGHWAY USERS.
Texas Transportation Inst., College Station.
For primary bibliographic entry see Field 5E.
PB-194 954 HC$3.00 MF$0.65

ANNOTATED BIBLIOGRAPHY AND SUMMARY OF RESEARCH NEEDS IN THE HUMAN FACTORS ASPECTS OF DRIVER VISUAL COMMUNICATIONS.
Texas Transportation Inst., College Station.
For primary bibliographic entry see Field 5E.
PB-194 955 HC$3.00 MF$0.65

PSYCHOPHYSIOLOGICAL MEASUREMENTS AS RELATED TO THE OPERATION OF A MOTOR VEHICLE.
Texas Transportation Inst., College Station.
For primary bibliographic entry see Field 5E.
PB-194 956 HC$3.00 MF$0.65

SIGNIFICANT POINTS FROM THE DIAGNOSTIC FIELD STUDIES: SUMMARY REPORT.
Texas Transportation Inst., College Station.
For primary bibliographic entry see Field 5E.
PB-194 983 HC$3.00 MF$0.65

PROJECT DRIVER.
Oklahoma Univ. Research Inst., Norman.
For primary bibliographic entry see Field 5D.
PB-195 133 HC$3.00 MF$0.65

5K. Sociology

AREA HANDBOOK FOR COLOMBIA,
American Univ Washington D C Foreign Area Studies Div
For primary bibliographic entry see Field 5C.
AD-713 082 MF$0.65

AREA HANDBOOK FOR NICARAGUA,
American Univ Washington D C Foreign Area Studies Div
For primary bibliographic entry see Field 5C.
AD-713 083 MF$0.65

AN EMPIRICAL STUDY OF A MODEL AND STRATEGIES FOR PLANNED ORGANIZATIONAL CHANGE.
Technical rept. 1 Oct 69-1 Oct 70,
Michigan Univ Ann Arbor Inst for Social Research
Mark Aric Frohman. 30 Sep 70, 203p
Contract N00014-67-A-0181-0013

Descriptors: (*Group dynamics, Theory), (*Organizations, Transformations), Models (Simulations), Test methods, Stress (Psychology), Feedback, Factor analysis, Statistical processes, Regression analysis, Research program administration, Attitudes, Performance (Human).
Identifiers: Institutional change, *Social change.

The document reports on the test of a model of planned social change. Based on the Lewinian model, the research examines the relationship of some phenomenological antecedents of change and intervention strategies to subsequent change in an organization. Four programs, using different intensities of outside resource assistance, are studied for their success in producing organizational development, controlling for prior levels of job related tension, valence, and potency. (Author)
AD-713 231 HC$3.00 MF$0.65

CHRONIC MOVERS AND THE FUTURE REDISTRIBUTION OF POPULATION: A LONGITUDINAL ANALYSIS,
Rand Corp Santa Monica Calif
Peter A. Morrison. Oct 70, 30p Rept no. P-4440
Availability: Paper copy available from RAND Corp., Santa Monica, Calif. $1.00. No copies furnished by DDC or NTIS.

Descriptors: (*Population, Mobility), (*Urban planning, Mathematical prediction), (*Performance (Human), Pattern recognition), Statistical distributions, Factor analysis, Rural areas, Attitudes, Regression analysis, Sociometrics, Dynamics.
Identifiers: Chronic residence changers.

A successful urban growth policy involves anticipating the effects of migration and future population distribution. The research reported attempts to identify quantitative relationships between individual - and household-level factors and the differential propensity to move. The findings indicate that redistribution of population may be largely influenced by habitual movers who change residence repeatedly and frequently. A second objective is concerned with improving techniques for projecting aggregate levels of mobility. The questions include how the effects of habitual movement are manifested at the metropolitan scale, and for predictive purposes, which aggregate indices hold the most important features of local population composition. (Author)
AD-713 429

HOUSING ELEMENT, CHERRYVILLE, NORTH CAROLINA.
North Carolina State Dept. of Local Affairs, Salisbury. Div. of Community Planning.
For primary bibliographic entry see Field 13B.
PB-194 889 HC$3.00 MF$0.65

HOUSING MONITORING SYSTEM.
Department of Metropolitan Development, Indianapolis. Div. of Planning and Zoning.

Sep 70, 31p

Descriptors: (*Residential buildings, Statistical data), (*Regional planning, Indiana), Demographic surveys, Project planning, Monitors, Requirements, Population migrations, Ethnic groups, Urban areas, Rural areas.
Identifiers: *Indianapolis (Indiana), *Marion County (Indiana).

The report discusses the current housing situation in Marion County, the problems that are evident from it and necessity of continuously knowing and analyzing its changes. An ongoing housing monitoring system is suggested to keep track of the housing market. The report enumerates the types of data needed for a system, suggests agencies to supply such data, and gives a method of organizing and keeping the information current. (Author)
PB-194 930 HC$3.00 MF$0.65

ECONOMIC CRIMES: THEIR GENERATION, DETERRENCE AND CONTROL.
Final rept.,
California Univ., Santa Barbara.
Harold l. Votey, Jr., and Llad Phillips. 31 Dec 69, 135p* LEAA-NI-69-041
Contract LEAA-NI-69-041

Descriptors: (*Crimes, Economic analysis), (*Law enforcement, Efficiency), Classifications, Trends, Cost effectiveness, Statistical data, Pattern recognition, Mathematical models, Prevention, Correlation techniques, Control.
Identifiers: *Crime generation, *Crime deterrence.

The report summarizes the findings of an economic analysis of national crime, crime trends, and law enforcement activities. The study is concerned with the 7 FBI index crimes: homicide, rape, aggravated assault, robbery, burglary, larceny and auto theft, as reported in the Uniform Crime Reports of the FBI for the years 1952-1967. In this study the behavioral theories of economics are applied to the crime problem in order to determine whether such an approach will shed any light on possible solutions. The results of analytical techniques applied showed that deterioration of labor market opportunities for youths, increased school enrollment rates for youths, inadequate growth of per-capita expenditures on law enforcement, and decline in police effectiveness, as measured by the ratio of offenses cleared by arrest to known offenses commencing in the late '50s and early '60s, have encouraged criminality and induced higher crime rates. The study further showed there has been an increase in the efficiency of law enforcement, notwithstanding the decline in the effectiveness of law enforcement as measured, and that success in the crime war will require a two-front approach. (LEAA abstract)
PB-194 984 HC$3.00 MF$0.65

AN ECONOMIC ANALYSIS OF THE DISTRIBUTION OF POLICE PATROL FORCES.
Final rept.,
Miami Univ., Oxford, Ohio. Dept. of Economics.
J. Fred Giertz. 1 Apr 70, 127p* LEAA-NI-69-080
Contract LEAA-NI-69-080

Descriptors: (*Crimes, Prevention), (*Police, Deployment), (*Criminology, Statistical analysis), Economic analysis, Statistical distributions, Urban areas, Demography, Correlation techniques, Benefit cost analysis, Management planning, Illinois, California.
Identifiers: Management information systems, Chicago (Illinois), Los Angeles (California).

The purpose of the study is to use the techniques of economic analysis to investigate the distribution of police among the various districts of a city. Police protection refers to resources used primarily for the purposes of crime control and prevention. The study deals primarily with police patrol activities since this is the most important type of preventive activity. The first section analyzes the existing distribution of police and index crimes in the city of Chicago, investigating the relationship between the number of police and the amount of crime in a given district and the relevant demographic and economic characteristics of the area. The second section deals with various alternative distribution plans in several precincts in the city of Los Angeles which might be used by police administration and their implications. A decision model is established utilizing the hypothesized preventive effect on crime of police patrol to analyze the various plans. A more precise measure of the benefits of police protection is set forth involving the reduction in the cost of index crimes to society. (LEAA abstract)
PB-194 985 HC$3.00 MF$0.65

STEARNS COUNTY RECREATION AND RESOURCES PLAN.
Consulting Services Corp., Seattle, Wash.

Jul 69, 35p
Sponsored in part by State Planning Agency, Minnesota.

Descriptors: (*Recreational facilities, Regional planning), (*Regional planning, *Minnesota), (*Natural resources, Regional planning), Inventories, Urban areas, Classifications, Requirements, Parks, Roads, Topographic features, Wildlife, Plants (Botany).
Identifiers: *Stearns County (Minnesota), Outdoor recreation.

The report presents a plan for outdoor recreation and conservation in Stearns County, Minnesota. It recommends the extent and nature of county involvement as well as a program for coordinating the efforts of other public agencies and private interests. The plan has been developed in coordination with the other elements of the comprehensive plan for Stearns County, including those for land use and thoroughfares. (Author)
PB-195 011 HC$3.00 MF$0.65

NEW YORK STATE APPALACHIAN RESOURCE STUDIES: RECREATION AND CULTURE. PHASE I: INVENTORY.
New York State Office of Planning Coordination, Albany.

1970, 144P
Sponsored in part by Department of Housing and Urban Development, Washington, D.C.

Descriptors: (*Recreational facilities, *Natural resources), (*Regional planning, *New York), Inventories, Economic analysis, Classifications, Climatology, Forest land, Demography, Culture (Social sciences), Soils, Transportation, State government, Statistical data.
Identifiers: Appalachian region.

The volume contains a summary of the existing recreational and cultural resources of the New York state Appalachian region, including an inventory of local, county, state and federal facilities, and a preliminary analysis. Agriculture, climate, community facilities, forestry, manpower and industry, mineral resources, recreation and cultural facilities, soils, transportation and water resources are covered. (Author)
PB-195 023 HC$3.00 MF$0.65

HUMAN RESOURCES MANAGEMENT SYSTEM. COMMUNITY EVALUATION MODEL. MANUAL B-MODEL 1.2.
Ozarks Regional Commission.
For primary bibliographic entry see Field 5I.
PB-195 034 HC$3.00 MF$0.65

EVALUATION OF FOUR RURAL HOUSING PROGRAMS.
Auerbach Corp., Philadelphia, Pa.
For primary bibliographic entry see Field 13B.
PB-195 147 HC$3.00 MF$0.65

CURRENT STATEWIDE HOUSING PROGRAMS,
Alaska State Housing Authority, Anchorage.
For primary bibliographic entry see Field 13B.
PB-195 260 HC$3.00 MF$0.65

POPULATION GROWTH IN THE MID WILLAMETTE VALLEY.
Mid Willamette Valley Council of Governments, Salem, Oreg.
For primary bibliographic entry see Field 13B.
PB-195 269 HC$3.00 MF$0.65

HOUSING: CHALLENGES AND OBJECTIVES IN THE MID WILLAMETTE VALLEY.
Mid Willamette Valley Council of Governments, Salem, Oreg.
For primary bibliographic entry see Field 13B.
PB-195 271 HC$3.00 MF$0.65

6. BIOLOGICAL AND MEDICAL SCIENCES

6A. Biochemistry

A HISTOCHEMICAL STUDY OF LIVER ENZYMES INVOLVED IN GLYCOGEN METABOLISM IN THE X-IRRADIATED RAT.
Armed Forces Radiobiology Research Inst Bethesda Md
For primary bibliographic entry see Field 6R.
AD-713 087 HC$3.00 MF$0.65

CATABOLIC PHASE OF HEMIN CHROMOPROTEIN METABOLISM,
Pennsylvania Univ Philadelphia Dept of Biochemistry
For primary bibliographic entry see Field 6P.
AD-713 169 HC$3.00 MF$0.65

THE ROLE OF SULFHYDRYL GROUPS IN THE ACTIVITY OF TYPE A BOTULINUM TOXIN,
Fort Detrick Frederick Md
John N. Knox, William P. Brown, and Leonard Spero. 9 Mar 70, 6p
Availability: Pub. in Biochimica et Biophysics Acta, v214 p350-354 1970, Rept. no. BBA-35622.

Descriptors: (*Clostridium botulinum, *Thiols), (*Toxins + antitoxins, Clostridium botulinum), Toxicity, Chemical properties, Bacteria, Stability, Chemical analysis.

Both crystalline botulinum toxin, Type A, (mol. wt. 900,000) and a lower molecular weight form (about 130,000) derived from it, have 4-SH groups and approx. 1 disulfide bridge per 100,000 g protein. Both forms were increasingly inactivated over a 24-h period to one-tenth of the original toxicity by p-mercuribenzoate (PMB) but iodoacetamide caused a smaller reduction and N-ethylmaleimide had no effect at all. Reversal of the PMB inactivation by reduced glutathione could not be achieved. It is concluded that reaction of -SH groups may affect conformational stability of botulinum toxin, but these groups are not an integral part of its active center. (Author)
AD-713 326

A METHOD FOR THE ONE-DIMENSIONAL THIN-LAYER CHROMATOGRAPHIC SEPARATION OF SERUM PHOSPHOLIPIDS.
Medical research interim rept.,
Naval Medical Research Inst Bethesda Md
George M. Adams, and Terry L. Sallee. 19 Feb 70, 5p NAVMED-M4306.02-4010B-2
Availability: Pub. in Jnl. of Chromatography, v49 p552-554 1970.

Descriptors: (*Phospholipids, *Thin layer chromatography), Blood serum.

The paper describes a method for the one-dimensional thin-layer chromatographic separation of serum phospholipids. (Author)
AD-713 341

ENZYMES OF GLUCOSE METABOLISM IN THE CAECUM OF THE MARINE BORER BANKIA SETACEA,
British Columbia Research Council Vancouver
D. L. Liu, and C. C. Walden. 10 Jul 69, 6p
Contract Nonr-4505 (00)
Availability: Pub. in Jnl. Fisheries Research Board of Canada, v27 n6 p1141-1146 1970.

Descriptors: (*Enzymes, *Mollusca), (*Gastrointestinal system, Mollusca), (*Glycolysis, Mollusca), (*Marine borers, Metabolism), Biosynthesis, Cellulose, Citric acids, Pentoses, Glucose, Aquatic animals.
Identifiers: *Caecum, *Bankia setacea, *Teredinideae, Carbohydrate metabolism.

The caecum of the marine borer Bankia setacea was found to contain the enzymes for a modified Embden-Meyerhof pathway, a pentose cycle, and a complete citric acid cycle. The pathways are linked to the digestion of cellulose by the enzyme cellobiase. Significant numbers of bacteria were not detected in the caecum of the borer. Enzyme activities in the citric acid cycle indicate a biosynthesis role for the caecum. (Author)
AD-713 342

THE EFFECT OF OXYGEN AND QUINONE CONCENTRATION ON THE REVERSIBLE LIGHT-INDUCED PROTON UPTAKE OF THE CHLOROPHYLL b-BENZOQUINONE SYSTEM,
Air Force Cambridge Research Labs L G Hanscom Field Mass
For primary bibliographic entry see Field 7E.
AD-713 381

THE INFLUENCE OF ALTERED VIRAL VIRULENCE ON THE RESPONSE OF HOST SERUM ALPHA GLYCOGLOBULINS,
Army Medical Research Inst of Infectious Diseases Frederick Md
J. Brent Rollins, George A. Burghen, and William R. Beisel. 20 Jul 70, 6p
Revision of report dated 19 May 70.
Availability: Pub. in Jnl. of Infectious Diseases, v122 n4 p329-334 Oct 70.

Descriptors: (*Glycoproteins, *Infections), (*Virus diseases, Glycoproteins), Metabolism, Hepatitis viruses, Attenuation, Vaccines, Responses, Infectious diseases, Blood serum, Viruses, Dogs, Globulins, Blood chemistry.
Identifiers: *Infectious canine hepatitis.

Young beagle dogs, some immune and some nonimmune to infectious canine hepatitis (ICH), were given either virulent or attenuated ICH virus. Nonimmune dogs infected with virulent ICH virus showed early large increases in alpha 2 glycoglobulin that occurred before increases in hepatic enzyme and hepatocellular damage, while immune dogs given attenuated or virulent virus and nonimmune dogs given attenuated ICH virus showed no such changes. These observations imply that neither the entry or replication of a virus in the host nor cellular destruction serves to stimulate the early increase in alpha 2 glycoglobulin. Rather, this phenomenon appears to be a nonspecific host response associated with the onset of systemic illness. (Author)
AD-713 401

THE EFFECT OF PROTEOLYTIC ENZYMES ON THE ACTIVATION OF Cl. perfringens PROTOTOXIN, TYPES D AND E (Deistvie Proteoliticheskikh Fermentov na Aktivatsiyu Prototoksinov Cl. Perfringens Tipov D i E),
Army Foreign Science and Technology Center Washington D C
For primary bibliographic entry see Field 6M.
AD-713 472 HC$3.00 MF$0.65

CONFORMATIONAL STUDIES ON THE ACTIVE SITE OF ACETYLCHOLINESTERASE BY ELECTRON PARAMAGNETIC RESONANCE,
Edgewood Arsenal Md
Joel D. Morrisett, Clarence A. Broomfield, and Brennie E. Hackley, Jr. 1970, 15p

Descriptors: (*Acetylcholinesterase, *Paramagnetic resonance), (*Molecular structure, Acetylcholinesterase), Chemical reactions, Organic phosphorus compounds, Chemical warfare agents.
Identifiers: *Electron paramagnetic resonance, Molecular conformations, *Chemical warfare therapeutic agents.

Poisoning by 'refractory' anticholinesterases is not reversed by oxime therapy because of the phenomenon of 'ageing', the spontaneous dealkoxylation or dealkylation from the phosphonyl group attached to the active site serine residue. The research concerns the studies directed toward the elucidation of structure-function relationships in this enzyme. In particular, the authors were interested in the geometry and stereochemistry of the active site. Using spin labeled electron paramagnetic resonance, the authors gained several new pieces of information about the active site of acetylcholinesterase. First, the active site appears to be quite spacious and/or located superficially on the enzyme. Second, the conformation at the active site is detectably, but not greatly affected by removing the enzyme molecule from the membrane. Third, there appears to be on the membrane a sulfhydryl group located close enough to the active site of the membrane-bound enzyme to interact with the attached nitroxyl radical. (Author)
AD-713 563 HC$3.00 MF$0.65

DETERMINATION OF GAMMA-AMINOBUTYRIC ACID IN SINGLE NERVE CELLS OF CAT CENTRAL NERVOUS SYSTEM,
Tokyo Medical and Dental Univ (Japan) Dept of Pharmacology
K. Obata, M. Otsuka, and Yuriko Tanaka. 5 Nov 69, 5p ARDG (FE)-337
Grants DA-CRD-AFE-S92-544-67-G66, PHS-NB-07440
Availability: Pub. in Jnl. of Neurochemistry, v17 p697-698 1970.

Descriptors: (*Amino acids, *Nerve cells), Central nervous system, Analysis, In vitro analysis, Quantitative analysis, Cats, Japan.
Identifiers: *Butyric acid/amino.

In crustacean nervous system, gamma-aminobutyric acid (GABA) exists in specifically high concentration in inhibitory neurones where GABA serves as a chemical transmitter. It is, therefore, interesting to know whether the same is true in the mammalian central nervous system. In the present study a method for microdetermination of GABA was developed, and by the use of this method, attempts were made to analyse the GABA content of single neurones in cat central nervous system. (Author)
AD-713 600

THE EFFECT OF HYDROGEN PEROXIDE ON SERUM LECITHIN-CHOLESTEROL ACYTRANSFERASE ACTIVITY.
Interim rept. Sep 68-Jun 69,
School of Aerospace Medicine Brooks AFB Tex
Hubert S. Mickel, and Emmett L. Foulds, Jr. 27 Oct 69, 4p Rept no. SAM-TR-70-273
Presented at the Aerospace Medical Association Annual Meeting, San Francisco, Calif. May 69.
Availability: Pub. in LIPIDS, v5 n7 p663-664 1970.

Descriptors: (*Transferases, *Hydrogen peroxide), (*Enzymes, Hydrogen peroxide), Lipids, Cholesterol, Phospholipids, Blood plasma, Blood serum, In vitro analysis, Inhibition, Stimulation.

Lipid peroxidation is a potential hazard under conditions of hyperbaric oxygenation, or pure or oxygen-enriched atmospheres, and may occur as a consequence of breathing an atmosphere polluted with oxidants of industrial or domestic origin. An acyltransferase in plasma which effects the transfer of a fatty acid from the beta position of lecithin to cholesterol, forming cholesterol esters has been reported. Peroxide is shown to have a marked inhibitory effect on the enzyme activity in a concentration of 0.1M. There is a variable effect with a concentration of 0.01M, with stimulation of activity in some sera, while in others, an inhibition. The addition of a synthetic saturated lecithin does not cause a reversal of the inhibition at 0.1M hydrogen peroxide. (A THOR)
AD-713 637

DEOXYRIBONUCLEIC ACID HETEROGENEITY BETWEEN HUMAN AND MURINE STRAINS OF CHLAMYDIA TRACHOMATIS.
Naval Medical Research Inst Bethesda Md
For primary bibliographic entry see Field 6M.
AD-713 662

SOME EFFECTS OF D-AMPHETAMINE ON CARBOHYDRATE METABOLISM AT GROUND LEVEL AND ALTITUDE.
School of Aerospace Medicine Brooks AFB Tex
For primary bibliographic entry see Field 6S.
AD-713 726 HC$3.00 MF$0.65

EFFECT OF DIFFERENT NITROGEN SOURCES ON THE GROWTH OF WOOD-DESTROYING FUNGI IN CULTURE (Vliyanie Razlichnikh Istochnikov Azota na Rost Derevorazrushayu Shchikh),
Army Foreign Science and Technology Center Washington D C
For primary bibliographic entry see Field 6M.
AD-713 752 HC$3.00 MF$0.65

ELECTROPHORETIC RELEASE OF gamma-AMINOBUTYRIC ACID AND GLUTAMIC ACID FROM MICROPIPETTES,
Tokyo Medical and Dental Univ (Japan) Dept of Pharmacology
K. Obata, K. Takeda, and H. Shinozaki. 18 Sep 69, 6p ARDG (FE)-337
Grants DA-CRD-AFE-S92-544-67-G66, PHS-NB-07440
Availability: Pub. in Neuropharmacology, v9 p191-194 1970.

Descriptors: (*Pipettes, Electrophoresis), (*Amino acids, Pipettes), Glutamic acid, Osmosis, Laboratory equipment, Japan.
Identifiers: *Butyric acid/amino.

Rates of release of gamma-aminobutyric acid (GABA) and glutamic acid from glass micropipettes were determined by using radioisotope techniques. The transport number of GABA in the cationic state was 0.223 and that of glutamic acid 0.126. The largest release was obtained by electro-osmosis from a neutral solution of GABA. Hydraulic pressure applied to pipettes also caused a significant but variable outflow. (Author)
AD-713 825

BIOLOGICAL AND MEDICAL RESEARCH DIVISION ANNUAL REPORT, 1969.
Argonne National Lab., Ill.
For primary bibliographic entry see Field 6R.
For abstract, see NSA 24 20.
ANL-7635 HC$3.00 MF$0.65

BIOCHEMICAL EVOLUTION OF ENZYME SYSTEMS AS A BASIS OF THE FUNCTIONAL EVOLUTION OF VERTEBRATES.
Biokhimicheskaya Evolyutsiya Fermentnykh Sistem Kak Osnova Funktsionalnoy Evolyutsii Pozvonochnykh Zhivotnykh
Translation Consultants, Ltd., Arlington, Va.
N. A. Verzhbinskaya. Sep 70, 20p NASA-TT-F-13194
Contract NASW-2038
Coll- 20 P Refs Tran- Transl. Into English From the Publ. 'aiogenez I Nachalnyye Stadii Evolyutsii Zhizni' Moscow, Nauka Press, 1968 P 169-180

Descriptors: *Biochemistry, *Biological evolution, *Enzymes, *Vertebrates, Acetyl compounds, Choline, Synapses.

For abstract, see STAR 08 21.
N70-38319 HC$3.00 MF$0.65

COMPARATIVE BIOCHEMICAL STUDY OF MUSCLES.
Translation Consultants, Ltd., Arlington, Va.
For primary bibliographic entry see Field 6P.
For abstract, see STAR 08 21.
N70-38383 HC$3.00 MF$0.65

PLEUROTIN - STRUCTURE AND ADDITIONS, CONTRIBUTIONS FOR BIOGENESIS.
Pleurotin - Struktur Und Beitraege Zur Biogenese
Eidgenossische Technische Hochschule, Zurich (Switzerland).
H. Schelling. 1969, 118p DISS-4319
Lang- in German

Descriptors: *Antibiotics, *Biological evolution, *Molecular structure, Biochemistry, Drugs, Fungi.

For abstract, see STAR 08 21.
N70-38577 HC$3.00 MF$0.65

CONCENTRATION AND DESALTING OF PROTEIN SOLUTIONS PROGRAM.
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 7D.
For abstract, see NSA 24 20.
ORNL-TM-3001 HC$3.00 MF$0.65

RADIATION EFFECTS IN BIOCHEMISTRY AND ORGANIC CHEMISTRY.
Colorado Univ., Boulder.
For primary bibliographic entry see Field 6R.
For abstract, see NSA 24 20.
TID-25488 HC$3.00 MF$0.65

THE PHOTOCHEMISTRY AND BIOCHEMISTRY OF AROMATIC N-OXIDES.
California Univ., Berkeley. Lawrence Radiation Lab.
For primary bibliographic entry see Field 7E.
For abstract, see NSA 24 20.
UCRL-20037 HC$3.00 MF$0.65

6B. Bioengineering

COMPARISON OF AN AUTOMATIC SLEEP ANALYZER TO VISUAL ANALYSIS OF THE ELECTROENCEPHALOGRAM.
Technical rept.,
Texas Univ Austin Electronics Research Center
John Ben Bomar, Jr., P. C. Richardson, A. J. Welch, and F. B. Vogt. 26 Jul 70, 80p Rept no. TR-95 AFOSR-70-2051TR
Grant AF-AFOSR-1792-69

Descriptors: (*Sleep, Analysis), (*Electroencephalography, Instrumentation), Automation, Electrophysiology, Physiology, Design, Operation.

The report describes the evaluation of a prototype automatic sleep analyzer. Eight thousand minutes of visually scored sleep electroencephalogram (EEG) recorded from nine normal subjects were played back for scoring by an instrument designed to automatically estimate depth of sleep from the EEG. The linear correlation coefficients between the visual and machine scores were 0.67 for Lead O3 - F1 and 0.60 for Lead T5 - OzPz. Forty-eight percent of the scores were in agreement by stage; ninety-five percent agreed within one stage. The analyzer described was a small, easily operated device with an output suitable for graphical display of sleep stages. The instrument operates essentially in real time and accepts EEG directly from one scalp lead. User needs dictate the choice between visual or automatic EEG classification techniques. (Author)
AD-713 093 HC$3.00 MF$0.65

GENERAL PURPOSE MICROCAPACITOMETER (Universalnyi Mikrodozator),
Army Foreign Science and Technology Center Washington D C
V. P. Pristavko. 11 Jun 70, 7p Rept no. FSTC-HT-23-851-70
Trans. of Zashchita Rastenii, Moscow (USSR) v14 n11 p47-48 1969.

Descriptors: (*Entomology, Instrumentation), USSR, Design, Operation, Dosage, Insects, Insecticides.
Identifiers: Translations, *Microcapacitometers.

During entomological investigations it often becomes necessary to apply strictly dosed individual treatment of insects with insecticides, chemosterilizers, microbial preparations, etc. A variety of microcapacitometers are used for this purpose, and they are often quite complex and expensive. The design and operation of a general purpose microcapacitometer are presented. The device is simple in design and economical to manufacture. It can be used for a variety of purposes with a wide range of doses. The error of the device is plus or minus 0.004 mm. (Author)
AD-713 473 HC$3.00 MF$0.65

DETERMINING RESPIRATORY RATE AND VOLUME FROM ECG R-WAVE AMPLITUDE MODULATION.
Final rept.,
School of Aerospace Medicine Brooks AFB Tex
Bryan L. Steadman. Sep 70, 15p Rept no. SAM-TR-70-65

Descriptors: (*Respiration, Monitors), (*Electrocardiography, Respiration), Heart, Physiology, Biometry, Instrumentation, Correlation techniques, Electrophysiology.

Various ECG electrode placements were investigated to determine which location would yield an R-wave amplitude modulation with the highest possible degree of correlation to respiratory volume. Each subject breathed into a spirometer to generate an electrical signal proportional to instantaneous respiratory volume. This signal was simultaneously recorded with the various electrocardiographic signals sensed by the electrodes attached to the subject. This information was then digitized and a plot of R-wave amplitude versus respiratory volume was made and the coefficient of correlation was computed for each set of data. (Author)
AD-713 833 HC$3.00 MF$0.65

6C. Biology

ENZYMES OF GLUCOSE METABOLISM IN THE CAECUM OF THE MARINE BORER BANKIA SETACEA,
British Columbia Research Council Vancouver
For primary bibliographic entry see Field 6A.
AD-713 342

CONSIDERATIONS OF VOLUME, MASS, DNA, AND ARRANGEMENT OF MITOCHONDRIA IN THE MIDPIECE OF BULL SPERMATOZOA,
Armed Forces Inst of Pathology Washington D C
G. F. Bahr, and W. F. Engler. 10 Nov 69, 4p
Availability: Pub. in Experimental Cell Research, v60 p338-340 1970.

Descriptors: (*Mitochondria, *Reproductive system), Desoxyribonucleic acids, Physical properties, Structural properties, Electron microscopy, Cytology, Density.
Identifiers: Germ cells, *Spermatozoa.

The mitochondrial sheath of the midpiece of bull sperm has been found to consist of three spirals of close to 72 mitochondria joined end to end. Each spiral has 24 turns, i.e., there are about 24 to 25 mitochondria per spiral, one for each turn. The mitochondrial sheath occupies about 80% of the total volume of the midpiece. There is at least 1.24 x 10 to the minus 15th power g mitochondrial DNA associated with a midpiece, which is 0.04% of the nuclear DNA. (Author)
AD-713 353

ORIENTATION OF HUMAN AND AVIAN ERYTHROCYTES IN RADIO-FREQUENCY FIELDS,
Armed Forces Inst of Pathology Washington D C
J. L. Griffin. 11 Feb 70, 8p
Availability: Pub. in Experimental Cell Research, v61 p113-120 1970.

Descriptors: (*Erythrocytes, Electromagnetic fields), Radio waves, Responses, Cells (Biology), Biophysics.

Human and chicken erythrocytes are suspended in isotonic glucose or mixed isotonic glucose and saline orient when subjected to impressed radio-frequency fields. Erythrocyte orientation may be either across the field or with the field. The direction of orientation can be predicted from knowledge of the frequency of the impressed field and the conductivity of the suspending medium. The relationship between orientation and frequency can be changed by altering the osmotic environment. The type of chamber and the techniques used seem to offer both practical and theoretical (analytical) advantages over earlier procedures. While this paper deals with normal erythrocytes, the procedures could be applied to other systems with relative ease. (Author)
AD-713 355

PEARL CHAIN FORMATION ACROSS RADIO FREQUENCY FIELDS,
Armed Forces Inst of Pathology Washington D C
Joe L. Griffin, and Clifford D. Ferris. 19 Jan 70, 4p
Revision of report dated 22 Sep 69.
Availability: Pub. in Nature, v226 n5241 p152-154, 11 Apr 70.

Descriptors: (*Algae, Electromagnetic fields), (*Styrene plastics, Electromagnetic fields), (*Particles, Interactions), Dielectrics, Electric fields, Biophysics, Biochemistry, Polarization.
Identifiers: Pearl chains.

In work related to the analysis of orientation in radio frequency fields, reproducible formation of pearl chains across field lines has been observed in mixtures of electrically different particles. In this report the conditions under which chains across fields occur are described, and a possible explanation is presented. To distinguish them clearly from conventional pearl chains, which form parallel to the lines of flux (perpendicular to the electrodes), the chains of mixed particles that form perpendicular to (across) the lines of flux (parallel to the electrodes) will be called transverse pearl chains. (Author)
AD-713 360

ERGODIC PROPERTIES OF POPULATIONS I: THE ONE SEX MODEL,
California Univ Berkeley Dept of Computer Sciences
Beresford Parlett. 26 Jan 70, 18p
Contract N00014-69-A-0200-1017
Availability: Pub. in Theoretical Population Biology, v1 n2 p191-207 Aug 70.

Descriptors: (*Biometry, Matrix algebra), Mathematical models, Stochastic processes, Population (Mathematics), Theorems.
Identifiers: *Ergodic processes, Biometrics.

The present paper develops stable population theory from certain general propositions of mathematics. It takes advantage of the large body of analysis developed during this century concerning matrices whose elements are either zero or positive. This mathematical literature is scattered through many sources and the reorganization of its relevant parts into a coherent form bearing on population is a worthwhile undertaking. Once the mathematics is presented the reader will see that the propositions of stable pouplation theory follow immediately. One by-product of our approach to the subject is that it suggests several good methods for computing such things as the stable population matrix and the intrinsic growth rate. (Author)
AD-713 393

VISIT TO SOME BIOMEDICAL LABORATORIES IN ISRAEL AND GREECE.
Army Research and Development Group (Europe)
Apo New York 09757
For primary bibliographic entry see Field 6E.
AD-713 416 HC$3.00 MF$0.65

ALTERATION OF TASTE QUALITIES THROUGH NATURAL PRODUCTS,
Army Natick Labs Mass
For primary bibliographic entry see Field 6P.
AD-713 510 HC$3.00 MF$0.65

TACTICS IN THE DEVELOPMENT OF MINE DETECTOR DOGS,
Army Land Warfare Lab Aberdeen Proving Ground Md
John J. Romba. 1970, 8p

Descriptors: (*Mine detectors, *Dogs), Training, Conditioned reflex, Army research, Vietnam.
Identifiers: *Mine detector dogs, South Vietnam.

The paper describes the development and characteristics of two U. S. mine dog systems. The Mine Detection Dog was recently made operational and has undergone a 6 month evaluation in RVN. The Specialized Mine Detection Dog is currently in development. The training procedures for both have been based on the reward or approach principle of learning. (Author)
AD-713 577 HC$3.00 MF$0.65

GENETIC TRANSFORMATION IN THE GENUS PASTEURELLA,
Army Biological Labs Frederick Md
For primary bibliographic entry see Field 6M.
AD-713 586 HC$3.00 MF$0.65

MIGRATORY ANIMAL PATHOLOGICAL SURVEY.
Annual progress rept. no. 6, 1 Jan-31 Dec 69,
Applied Scientific Research Corp of Thailand Bangkok
H. Elliott McClure. Jul 70, 143p ARDG (FE)-315-4
Grant DA-CRD-AFE-S92-544-67-G75
See also report dated Jul 69, AD-696 471.

Descriptors: (*Birds, *Asia), Thailand, Japan, Malaya, China, North Korea, Diseases, Parasitic diseases, Pathology, Distribution, Ecology, Southeast Asia, Maps, Tables, Arthropods, Classification, Insects, Siphonaptera, Indonesia, Philippines.
Identifiers: *Animal migrations, *Bird banding, Swallows, Shrikes, Ardeids, Hirundinidae, Laniidae, Ardeidae.

A summary is given of the number of birds banded by MAPS field teams in 1969, listing 119,653 birds of 725 species that were ringed. More than 2,600 recoveries of 200 species which have been received and the migration routes of House Swallow, Ducks and Ardeids in Eastern Asia, as suggested by ring recoveries, are discussed. Ectoparasite collections from more than 700 species of birds are being identified by taxonomists and 505 genera and species of parasites are listed. (Author)
AD-713 610 HC$3.00 MF$0.65

TRICHOSOMOIDES IN THE NASAL CAVITY OF JAVA RATS,
Naval Medical Research Unit No 2 Taipei (Taiwan)
John H. Cross, W. Daniel Kundin, Gwilym S. Jones, Alberto M. Gaba, and Soewito Jososoedarno. 1970, 5p Rept no. NAMRU-2-TR-404
Availability: Pub. in Jnl. of Parasitology, v56 n3 p566 Jun 70.

Descriptors: (*Nematodes, Rats), (*Parasites, Rats), Nose, Indonesia, Morphology (Biology), Distribution.
Identifiers: *Trichosomoides nasalis, Host parasite relations.

This constitutes the second report of T. nasalis, and the finding of the parasite in rats in Rome, and now in Java, suggests that the nematode may be widely distributed throughout the world. (Author)
AD-713 654

THE VALUE OF BLACK SEA DECAPOD CRUSTACEA IN THE FEEDING OF FISHES AND DOLPHINS (Znachenie Desyatinogikh Rakoobraznykh Chernogo Morya v Pitanii Ryb i Delfinov),
Naval Intelligence Command Alexandria Va Translation Div
M. A. Dolgopolskaya. 28 Oct 70, 8p Rept no. NIC-Trans-3088 (c)
Trans. of Akademiya Nauk URSR, Kiev. Sevastopolska Biologichna Stantsiya. Trudy, v8 p214-219 1964.

Descriptors: (*Crustacea, Food), (*Fishes, Nutrition), (*Cetacea, Nutrition), (*Black Sea, Crustacea), Nutrition, Ecology, Aquatic animals, Plankton, Marine biology, USSR.
Identifiers: Translations, *Decapoda.

Data collected on fish feeding show that adult decapods serve as food for large numbers of Black Sea coastal fish and even mammals. With respect to the nutritional qualities of decapods, studies have shown that the fat content (in a dry-weight percentage of soft substance) reaches 8% in the shrimp Leander Squilla (L.), and 20% in crabs (Eriphia spinifrons Herbst). The amount of protein (in percentage of dry body weight) reached 64 in Leander squilla, an averaged 58.2. It averaged 54.46 in Pachygrapsus marmoratus Fabr., and 59.39 in Eriphia. The digestibility of decapods, particularly shrimp, was 78-84% for flounder and perch. Various substances found in the nutrition of fish were determined on the basis of the biological features of this organism, and they serve to explain the individual moments of the biology of the fish.
AD-713 795 HC$3.00 MF$0.65

CHLOROPHYLL METABOLISM IN GREEN PLANTS,
National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.
A. A. Shlyk. 1970, 302p SFCSI-AEC (TT-70-50009), TT-70-50009
Trans. of mono. Metabolizm Khlorofilla v Zelenom Rastenii, Minsk, 1965 396p. by B. Eisenkraft.

Descriptors: (*Plant physiology, Chlorophylls), (*Chlorophylls, Metabolism), Plants (Boany), Translations, USSR, Plant physiology, Radioactive isotopes, Mathematical analysis, Photosynthesis, Physiology, Biochemistry, Radiobiology, Radiochemistry.

Contents include: The metabolism of chlorophyll in green plants; Metabolic relationships of chlorophyll a and b in green plants; Metabolic characteristics of the phorbin and phytol fragments of chlorophyll a and b; Protochlorophyllide--the precursor of chlorophyll in green leaves; Chlorophyllide as the intermediate in the transformation of protochlorophyllide into chlorophyll in green leaves; Mathematical analysis of chlorophyll metabolism in green leaves; Metabolic heterogeneity of chlorophyll in green plants.
AEC-tr-7094 HC$3.00 MF$0.65

PHOTO-INITIATED PROCESSES IN VISION.
Technical progress rept. 14 Nov 69-15 Nov 70,
Wyoming Univ., Laramie. Dept. of Chemistry.
Anthony V. Guzzo. 1969, 7p
Contract AT (11-1)-1627

Descriptors: (*Vision, *Photochemical reactions), Proteins, Fluorescence, Organic pigments.

For abstract, see NSA 24 20.
COO-1627-11 HC$3.00 MF$0.65

MAMMAL REACTION TO HYDRODYNAMIC FORCES STUDIED,
Joint Publications Research Service, Washington, D.C.
Yu. G. Aleev. 21 Oct 70, 11p
Trans. of Mobile Roughness on the Surface of the Necters' Body as a Method of Decreasing Hydrodynamic Resistance, pub. in Zoologicheskii Zhurnal (USSR) v49 n8 p 1173-1180 1970.

Descriptors: (*Hydrodynamics, Mammals), (*Skin, Surface roughness), (*Dolphins (Mammals), Hydrodynamics), (*Swimming, Hydrodynamics), Translations, USSR, Resistance, Surface resistance, Mobility, Underwater environments, Cetacea, Dolphins (Mammals), Humans.

An experimental study of the pattern of movement of dolphin and human bodies using an underwater camera demonstrated the possibility of the passive formation of mobile roughness in the skin of Mammalia, due exclusively to the effect of external hydrodynamic forces. It is noted that this mobile roughness -- running waves of deformation in the skin -- facilitate the reduction of hydrodynamic resistance. (Author)
JPRS-51614 HC$3.00 MF$0.65

RESOURCES AND FISHERIES OF TUNAS AND RELATED FISHES IN THE ATLANTIC OCEAN,
Far Seas Fisheries Research Lab., Shimizu (Japan).
For primary bibliographic entry see Field 5C.
PB-194 882 HC$3.00 MF$0.65

DESIGN OF A SIMPLE PLANT EXPOSURE CHAMBER.
National Center for Air Pollution Control, Cincinnati, Ohio.
For primary bibliographic entry see Field 13B.
PB-195 151 HC$3.00 MF$0.65

THE INTERRELATION OF CARBON AND PHOSPHORUS IN REGULATING HETEROTROPHIC AND AUTOTROPHIC POPULATIONS IN AQUATIC ECOSYSTEMS.
Federal Water Quality Administration, Athens, Ga. National Pollutants Fate Research Program.
For primary bibliographic entry see Field 6F.
PB-195 195 MF$0.65

FURTHER DEVELOPMENT OF RADIOISOTOPE TECHNIQUES FOR MEASURING WATER MOVEMENT IN LARGE TREES,
Pacific Southwest Forest and Range Experiment Station, Berkeley, Calif.
For primary bibliographic entry see Field 2F.
For abstract, see NSA 24 20.
TID-25463 HC$3.00 MF$0.65

ENERGY METABOLISM AND ITS CONTROL IN HIGHER PLANTS.
Progress rept. Sep 68-Jul 70,
Pennsylvania Univ., Philadelphia. Johnson Research Foundation.
Walter D. Bonner, Jr. 13 Jul 70, 30p

Descriptors: (*Plants (Botany), *Metabolism), Mitochondria, Cytochromes, Oxidation.

For abstract, see NSA 24 20.
TID-25485 HC$3.00 MF$0.65

6D. Bionics

SHAPE SYNTHESIS, I,
Maryland Univ College Park Computer Science Center
Azriel Rosenfeld, and Emily Johnston. Sep 70, 33p Rept nos. Scientific-2, CSC-TR-70-130 AFCRL-70-0502
Contract F19628-70-C-0208

Descriptors: (*Pattern recognition, Artificial intelligence), (*Plants (Botany), Mathematical models), (*Phrase structure grammars, Programming (Computers)), Configuration, Computer programs, Scientific research.
Identifiers: *Shape synthesis, Digital pictures, *Natural shapes and patterns, Computer graphics, Tree leaves.

The project is concerned with the computer synthesis of classes of natural shapes and patterns. The goal is to gain an understanding of the types of mathematical models that can be used to specify such classes. In this initial study, an approach based on medial axis transformations was used, and the synthesis of leaf shapes was taken as a test problem. A computer program was written to implement the chosen approach, and a mathematical model for this approach - in effect, a picture grammar for the leaf shapes - was formulated. Explicit use of coordinates appears to be desirable in grammars of this type. (Author)
AD-713 163 HC$3.00 MF$0.65

VISUAL IDENTIFICATION OF PEOPLE BY COMPUTER.
Stanford Univ Calif Dept of Computer Science
For primary bibliographic entry see Field 9B.
AD-713 252 HC$3.00 MF$0.65

APPLICATION OF SENSING ARRAYS TO PHOTOGRAMMETRY AND METROLOGY,
Army Engineer Topographic Labs Fort Belvoir Va
For primary bibliographic entry see Field 8B.
AD-713 568 HC$3.00 MF$0.65

REPRESENTING NATURAL-LANGUAGE INFORMATION IN PREDICATE CALCULUS,
Stanford Univ Calif Dept of Computer Science
For primary bibliographic entry see Field 12A.
AD-713 841 HC$3.00 MF$0.65

PROMISE OF NEUROBIONIC APPLICATIONS DISCUSSED,
Joint Publications Research Service, Washington, D.C.
K. A. Ivanov-Muromskii. 15 Oct 70, 11p
Trans. from Rabochaya Gazeta (USSR) p4, 30 Aug 70.

Descriptors: (*Bionics, *Nervous system), Brain, Physiology, Cybernetics, Artificial intelligence, Translations, Bioengineering, USSR.
Identifiers: *Neurobionics, Neurocybernetics.

Neurobionics is the most promising division of bionics, which has as its goal the study and modeling of the activity of the nervous system of humans and animals in order to work out recommendations for creating new equipment, cybernietic systems, and means of computer technology. Neurobionics is now taking its first steps, but its importance is already visible. It can help the computer designer in creating unusually large machine memories; this science will be capable of proposing new variations of highly sensitive electronic 'eyes,' 'ears,' and 'noses' to the instrument designer. Neurobionics will help doctors in automating narcosis and anabiosis, and it will make it possible to attain control of stimulation and braking in the central nervous system, and to formulate reliable methods of evaluating the nervous and psychological conditions of a person, and these are means of combating various severe diseases, including psychological ones, as well as means of maintaining the efficiency of a machine operator who has to handle very complex technical machinery. (Author)
JPRS-51579 HC$3.00 MF$0.65

6E. Clinical Medicine

FEASIBILITY STUDY - AUTOMATED MEDICAL EXAMINING SYSTEM.
Mission analysis rept. 1 Dec 69-29 May 70.
Philco-Ford Corp Palo Alto Calif Western Development Labs

Sep 70, 171p Rept no. WDL-TR-4172 SAM-TR-70-82
Contract F41609-70-C-0012

Descriptors: (*Medical examination, Automation), Systems engineering, Feasibility studies, Data processing systems, Military medicine, Efficiency, Effectiveness.

The report describes the present Armed Forces Entrance and Examination Station (AFEES) operating system and identifies strengths and weaknesses. The analyses include all internal AFEES operations, processes traffic flow, and transactions as well as AFEES operations relating to other agencies. Tasks, functions, procedures and transactions amenable to improved efficiency, effectiveness, or accuracy through the application of present state-of-the-art technology are identified. (Author)
AD-713 073 HC$3.00 MF$0.65

FEASIBILITY STUDY AUTOMATED MEDICAL EXAMINING SYSTEM.
Special projects rept. 1 Dec 69-15 Jun 70.
Philco-Ford Corp Palo Alto Calif Western Development Labs
Sep 70, 59p Rept no. WDL-TR-4174 SAM-TR-70-85
Contract F41609-70-C-0012

Descriptors: (*Medical examination, Automation), Systems engineering, Feasibility studies, Data processing systems, Costs, Military medicine, Design, Efficiency, Effectiveness.

This report contains a description of equipment not now fully within the state-of-the-art which would be highly desirable for inclusion in the proposed Automated Medical Examination System (AMES) prototype system or in a second generation system. It also contains recommendations for additional studies and investigations to further define certain Armed Forces Entrance and Examination (AFEES) related problem areas. (Author)
AD-713 086 HC$3.00 MF$0.65

FOURIER ANALYSIS OF KOROTKOFF VIBRATIONS.
Technical rept.,
Texas Univ Austin Electronics Research Center
Robert W. Pederson, P. C. Richardson, A. J. Welch, and F. B. Vogt. 20 Jul 70, 162p Rept no. TR-93 AFOSR-70-2049TR
Grant AF-AFOSR-1792-69

Descriptors: (*Blood pressure, Measurement), Fourier analysis, Hypotension, Physiology, Spectrum analyzers.
Identifiers: *Korotkoff vibrations.

Blood pressure measurements were made on two subjects, a healthy subject and a patient in clinical shock in whom the Korotkoff sounds were absent. The Korotkoff vibrations were detected by a piezoelectric transducer and recorded during a blood pressure measurement cycle on each subject. The Korotkoff vibrations were digitized and spectral analysis performed using the fast Fourier transform algorithm. Results of this experiment demonstrate that characteristic Korotkoff vibrations are detectable in hypotensive subjects even when the Korotkoff sounds are absent. The amplitude-frequency spectrum of these detected Korotkoff vibrations show abrupt changes in

character as cuff pressure is reduced. In the normo-tensive subject, abrupt changes were found to occur at the systolic and diastolic indices. (Author)
AD-713 091 HC$3.00 MF$0.65

TAETIGKEITSBERICHTE 1969. FAHGEBIET 6: FLUGRAUMPHYSIK, RAUMSIMULATION, FLUGMEDIZIN (Activity Report 1969. Division 6: Space Flight Physics, Space Simulation, Flight Medicine),
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Porz-Wahn (West Germany)
For primary bibliographic entry see Field 22A.
AD-713 212

SYNERGISM OF THYMUS AND BONE MARROW IN THE PRODUCTION OF GRAFT-VERSUS-HOST SPLENOMEGALY IN X-IRRADIATED HOSTS.
Medical research interim rept.,
Naval Medical Research Inst Bethesda Md
Henry R. Hilgard. 2 Apr 70, 14p NAVMED-MR005.02-0013A-2
Availability: Pub. in Jnl. of Experimental Medicine, v132 n2 p317-328, 1 Aug 70.

Descriptors: (*Bone marrow, Transplantation), (*Thymus, Transplantation), (*Transplantation, *Spleen), (*Radiobiology, Transplantation), Cells (Biology), Immunology, Responses, X rays.
Identifiers: *Synergism, *Splenomegaly.

Graft-versus-host splenomegaly may be elicited from 500 R X-irradiated F1 hybrid hosts if the hosts are injected with bone marrow cells and thymus cells from parental strain donors. Cells from thymus only or bone marrow only will not elicit graft-versus-host splenomegaly in these hosts. In this requirement for cells from both sources, the bone marrow cells play a nonimmunologic, proliferative role in the splenomegaly, and the thymus cells carry out the immunologic attack. Thus the mechanism of this synergism is quite different from that reported for the humoral immune response to sheep erythrocytes in which both thymus and marrow interact in the production of the specific immunologic response itself. (Author)
AD-713 321

IMMUNOBIOLOGY OF HUMAN ANTI-IgA: A SEROLOGIC AND IMMUNOGENETIC STUDY OF IMMUNIZATION TO IgA IN TRANSFUSION AND PREGNANCY,
California Univ San Francisco School of Medicine
G. N. Vyas, and H. H. Fudenberg. 1970, 20p
Contract Nonr-3656 (12), Grant PHS-AM-08527
Presented at the Annual Meeting of the American Association of Blood Banks (20th), Washington, D. C., Oct 68, and Congress of the International Society of Blood Transfusion (12th), Moscow (USSR) Aug 69.
Availability: Pub. in Unidentified journal.

Descriptors: (*Gamma globulin, *Immunology), (*Blood transfusions, Immunology), Blood serum, Pregnancy, Antigens + antibodies, Immunity, Serodiagnosis, Genetics, USSR.

Human antibodies to human IgA are detected by a sensitive passive hemagglutination assay using IgA paraproteins. The antibodies have a dichotomy of specificities: (1) class-specific with titers frequently higher than 1:1000 produced by persons lacking IgA, and (2) antibodies with limited specificity (titers less than 1:256) produced by persons with normal IgA when repeatedly transfused. Either type of anti-IgA belonging to the IgG class was present in 86 per cent of the patients with anaphylactoid and urticarial transfusion reactions, which was consistent with binding of the complement by such antibodies. Anti-IgA antibodies were detected in 16 per cent of the cases with multiple transfusions received during openheart surgery procedure; they also have a significantly high incidence in the sera of recently delivered women. One fetus had IgM anti-IgA, probably as a result of immunization to maternal IgA. Serum obtained from a Caucasian woman before and after an anaphylactoid reaction to a blood transfusion contained anti-IgA antibodies of limited specificity of the IgG class, possibly as a result of isoimmunization in pregnancy. The patient's serum was used as an agglutinator in passive hemagglutination assays on normal serum, which resulted in the definition of Am (1), the first genetically determined allotype of human IgA. (Author)
AD-713 328

COMPARATIVE PATHOLOGY OF OVARIAN NEOPLASMS. IV. GONADAL STROMAL TUMOURS OF CANINE SPECIES,
Armed Forces Inst of Pathology Washington D C
H. J. Norris, F. M. Garner, and H. B. Taylor. 20 Oct 69, 11p
See also AD-708 610.
Availability: Pub. in Jnl. Comparative Pathology, v80 p399-405 1970.

Descriptors: (*Neoplasms, *Ovaries), (*Dogs, Neoplasms), Sex glands, Germ cells, Pathology, Histology, Cells (Biology), Veterinary medicine.
Identifiers: *Gonads.

The clinical and pathological features of 26 neoplasms derived from ovarian stroma of canine species were analysed. Three types were identified: granulosa tumours, neoplasms with a Sertoli pattern, and a heterogeneous group regarded simply as nonspecific gonadal stromal tumours. All three types of neoplasm were found in mature dogs. Hyperoestrinising effects occurred in five animals of the granulosa group, three (50 per cent.) with Sertoli tumours and four of those with nonspecific gonadal stromal tumours. Granulosa tumours were clearly malignant, as three had spread beyond the ovary, in contrast to the neoplasms of the other two groups, none of which had metastasised. Tumours with a Sertoli pattern were closely related to granulosa tumours, as they were composed of cells similar to granulosa cells at the periphery of developing follicles and within some atretic follicles of the canine ovary. There were also overlapping patterns with granulosa tumours. Leydig cells and androgenic effects were absent. The neoplasms in this study were compared with tumours of other mammalian species from the standpoint of frequency, morphological pattern and behaviour. (Author)
AD-713 352

EFFECT OF REGIONAL SHIELDING AND BACTERIAL ENDOCARDITIS IN X-IRRADIATED RATS,
Armed Forces Inst of Pathology Washington D C
For primary bibliographic entry see Field 6R.
AD-713 354

ANTERIOR CHAMBER MEASUREMENTS ON CO2 LASER CORNEAL IRRADIATION,
Northeastern Univ Boston Mass Dept of Biophysics and Biomedical Engineering
D. MacKeen, S. Fine, L. Feigen, and B. S. Fine. 9 Feb 70, 7p
Contracts DA-49-193-MD-2436, DA-49-193-MD-2437
Sponsored in part by Grants PHS-Ey-00397 and NGR-22-011-007. Prepared in cooperation with George Washington Univ. Washington, D. C. Dept. of Opthalmology. Revision of report dated 29 Sep 69.
Availability: Pub. in Investigative Ophthalmology, v9 n5 p366-371 May 70.

Descriptors: (*Cornea, Lasers), (*Gas lasers, Radiation effects), Eye, Ophthalmology, Proteins, Pressure, Body fluids, Heat, Thresholds (Physiology), Temperature.
Identifiers: Carbon dioxide lasers.

At threshold irradiation (0.1 w./sq cm) of the rabbit cornea with a carbon dioxide (CO2) laser, there was no detectable rise in intraocular pressure and only a slight (1 to 2C.) rise in aqueous temperature. On suprathreshold CO2 corneal irradiation, the intraocular pressure rose to a plateau during irradiation and then gradually fell. There was a concomitant rise in temperature in the anterior chamber caused by heat conduction from the site of corneal irradiation. Further rise in the temperature of the corneal stroma to the critical temperature range for heat shrinkage of collagen causes the cornea to thicken. This thickening of the cornea helps to bring heated aqueous under the irradiated site more closely in apposition to the lens and iris, thus further increasing the temperature of the anterior lens. Lens indentation was observed in fixed eyes only following pulses of sufficient power and duration to raise the temperature near the surface of the anterior lens to a range of at least 60 to 70C. Increase in aqueous protein occurred only with irradiation over regions of the iris diaphragm. (Author)
AD-713 359

RPC OF THE MONTH FROM THE AFIP,
Armed Forces Inst of Pathology Washington D C
William J. Maroun, Sidney W. Nelson, Jerald Zimmer, and Maurice M. Reeder. Jun 70, 8p
Availability: Pub. in Radiology, v96 n3 p649-656 Sep 70.

Descriptors: (*Pathology, *Radiography), (*Neoplasms, Intestines), Diagnosis, X rays, Diagnostic agents, Cancer, Gastrointestinal system, Histology.

Villous adenomas are broad-based, usually benign tumors which are most commonly found in the rectum or sigmoid colon, although they may occur anywhere in the large bowel and rarely in the small intestine. These tumors are encountered primarily in later life, being most common in the sixth, seventh, and eighth decades. There is no apparent familial or sex predilection. Villous adenoma usually occurs as a single tumor and is said to represent only about 2% of all neoplasms of the colon and rectum; however, benign or malignant tumors elsewhere in the colon may be associated with villous adenoma in about one-third of the cases seen.
AD-713 361

LYMPH PRODUCTION DURING STAPHYLOCOCCIC B ENTEROTOXEMIA-INDUCED SHOCK IN MONKEYS,
Army Medical Research Inst of Infectious Diseases Frederick Md
D. A. Rhoda, and W. R. Beisel. 18 Feb 70, 7p
Availability: Pub. in American Jnl. of Veterinary Research, v31 n10 p1845-1851 Oct 70.

Descriptors: (*Shock (Pathology), *Lymph), (*Staphylococcus, Shock (Pathology)), Body fluids, Bacteria, Infections, Monkeys, Toxicity, Hypotension, Blood pressure, Blood vessels, Permeability.

Changes in production of lymph during enterotoxemia induced by administration of staphylococcic enterotoxin B (SEB) were determined in rhesus monkeys (Macaca mulatta). Radioiodinated serum albumin (RISA) kinetics, thoracic duct lymph flow, and central arterial pressure were measured, and vascular permeability was derived by calculation. Control monkeys studied with an identical experimental method had relatively stable measurements for many hours, but monkeys with enterotoxemia induced by an intravenous (I.V.) injection of SEB had hypotension, increased thoracic duct lymph flow, and altered RISA kinetics indicative of an increased vascular permeability. These data indicated that toxic effects on vascular endothelium were initiated by SEB. (Author)
AD-713 400

THE INFLUENCE OF ALTERED VIRAL VIRULENCE ON THE RESPONSE OF HOST SERUM ALPHA GLYCOGLOBULINS,
Army Medical Research Inst of Infectious Diseases Frederick Md
For primary bibliographic entry see Field 6A.
AD-713 401

VISIT TO SOME BIOMEDICAL LABORATORIES IN ISRAEL AND GREECE.
Technical rept.,
Army Research and Development Group (Europe) Apo New York 09757
J. B. Bateman. Jul 70, 98p Rept no. CRDARE-6
Errata sheet inserted.

Descriptors: (*Medical research, *Israel), (*Greece, Medical research), Symposia, Medical laboratories, Biological laboratories, Toxicity, Venoms, Water pollution, Microbiology, Pharmacology, Drugs, Entomology, Immunology, Biochemistry, Toxins + antitoxins, Plants (Botany), Universities.

Contents include: The Second International Symposium on Animal and Plant Toxins; Visit to Mekoroth Water Company, physiological effects of desalinated and brackish water; The 'Oholo' symposium on microbial toxins; Haifa - Israel Institute of Technology; Ness Ziona, Israel Institute for Biological Research; Yafo (Jaffa) - Cardiac Rehabilitation Unit of Tel Aviv University; Rehovot - Weizmann Institute of Science; Athens, U.S. Embassy and 'Democritus' Nuclear Research Center; and Topics of possible interest in the U.S. Army research plan.
AD-713 416 HC$3.00 MF$0.65

THE PUPIL -- IMPORTANCE IN THE OPTICS OF THE VISUAL SYSTEM. PART I. CLINICAL DATA,
Rand Corp Santa Monica Calif
Hubert L. Moshin, and Edward Goodlaw. Oct 70, 25p* Rept no. P-4469
Presented at the December Meeting of the American Academy of Optometry in Florida.

Descriptors: (*Ophthalmology, Eyeglasses), (*Eye, Statistical data), Aging (Physiology), Sex, Vision, Light, Statistical analysis, Population.
Identifiers: *Contact lenses, *Pupil (Anatomy).

Closeup photographs were taken of each eye of 163 patients who had obtained and were wearing contact lenses. These photographs were taken in both an illuminated and a dark environment. Twenty-three variables were recorded and seven of these, relative to the pupil diameter, were analyzed. These data were then evaluated against the findings of other investigators. (Author)
AD-713 427 HC$3.00 MF$0.65

THE FRICTION BLISTER,
Letterman Army Inst of Research San Francisco Calif
William A. Akers, and Marion B. Sulzberger. 1970, 14p

Descriptors: (*Wounds + injuries, *Skin), Thresholds (Physiology), Therapy, Skin friction, Textiles, Materials, Feet, Shoes, Military personnel.
Identifiers: *Vesications.

Friction blisters rank high as causes of military disability. Controlled studies show that: Friction blisters are not burns but are due to shearing forces within the epidermis. These produce a cleft into which fluid passes, provided there is a sufficient pressure gradient from blood vessels and tissue fluid; friction blister fluid contains most of the proteins of the blood serum but in lesser concentrations; drainage of intact blisters at 24 to 36 hours, leading to firm reattachment of the top, forms a serviceable dressing; in military situations most blisters will be encountered with their tops torn off. Then a good dressing can be made by applying a selected cyano-acrylate which forms an artificial top; friction blisters can be produced on monkey paws; the instruments and information now available permit comparison of the friction-producing properties of different fabrics, materials, foot-wear and other gear; and also of the susceptibility to friction blistering of different individuals and sites. (Author)
AD-713 503 HC$3.00 MF$0.65

TEMPORARY CAVITY EFFECTS IN BLOOD VESSEL INJURY BY HIGH VELOCITY MISSILES,
Edgewood Arsenal Md
For primary bibliographic entry see Field 6U.
AD-713 504 HC$3.00 MF$0.65

RETINAL DAMAGE BY Q-SWITCHED RUBY LASER,
Frankford Arsenal Philadelphia Pa
Edwin S. Beatrice, M. B. Landers, J. O. Powell, and G. H. Bresnick. 1970, 15p
Joint AMRDC-AMC Laser Safety Team.

Descriptors: (*Radiation injuries, Lasers), (*Retina, Burns), (*Lasers, Hazards), Eye, Damage, Radiation effects, Tissues (Biology), Thresholds (Physiology), Ophthalmology, Experimental data, Pathology, Histology, Visual inspection.
Identifiers: *Q switched lasers, *Ruby lasers.

In studies of retinal damage by the Q-switched ruby laser, threshold values were determined for both 'minimal' and large retinal spot sizes. In addition to using the conventional ophthalmoscopic methods for detecting injury in the living animal, histopathological examinations were performed on a number of irradiated eyes following enucleation. The microscopic evaluation of irradiated tissue was considered to be particularly important in the minimal retinal spot size experiments in order to support the ophthalmoscopic observations of very small retinal lesions. In analyzing the data the macular and extramacular exposure sites have been considered separately because of conflicting reports concerning the relative sensitivity f these two retinal areas to laser damage. (Author)
AD-713 511 HC$3.00 MF$0.65

A RESEARCH CONCEPT FOR THE INTERPRETATION OF HUMAN MISSILE WOUNDS BY THE PATHOLOGIST,
Armed Forces Inst of Pathology Washington D C
For primary bibliographic entry see Field 6U.
AD-713 524 HC$3.00 MF$0.65

OBSTACLES IN OXYGEN TRANSPORT DURING AEROMEDICAL EVACUATION,
Walter Reed Army Inst of Research Washington D C
For primary bibliographic entry see Field 6G.
AD-713 537 HC$3.00 MF$0.65

OBSERVATIONS ON EARLY DETECTION AND THERAPY OF THE DEFIBRINATION SYNDROME IN MENINGOCOCCEMIA,
Madigan General Hospital Tacoma Wash
C. L. Lutcher, L. A. Lindesmith, F. S. Pettyjohn, W. T. Steudel, and T. B. Dunkel. 1970, 8p

Descriptors: (*Neisseria meningitidis, Diseases), (*Septicemia, Neisseria meningitidis), (*Blood coagulation, Neisseria meningitidis), Therapy, Detection, Bacteria, Infections, Diagnosis, Blood, Military personnel, Infectious diseases.
Identifiers: *Meningococcemia, *Meningitis.

Forty seven culture proven cases of meningococcemia and or meningitis due to Neisseria meningitidis were diagnosed and treated. In nineteen other cases that were treated, meningococcal disease was strongly suspected despite negative blood and cerebrospinal fluid cultures. Particular attention was given to the early detection and therapy of the defibrination syndrome (diffuse intravascular clotting or DIC) in these patients. This entity is now recognized as the most common fatal complication of meningococcemia and is a problem of great significance to the overall military mission because of the high incidence of meningococcal disease in military recruits. This paper documents observations in detail. (Author)
AD-713 560 HC$3.00 MF$0.65

COMPARATIVE ANALYSIS OF MANDIBULAR AND MID-FACE FRACTURES IN MISSILE AND BLUNT TRAUMA: 4,015 CASES,
Letterman Army Inst of Research San Francisco Calif
For primary bibliographic entry see Field 6U.
AD-713 584 HC$3.00 MF$0.65

EFFECTS OF ALCOHOL ON MEMORY AND ITS IMPLICATIONS FOR FLYING SAFETY,
School of Aerospace Medicine Brooks AFB Tex
Ralph S. Ryback. Jul 70, 5p Rept no. SAM-TR-70-272
Availability: Pub. in Aerospace Medicine, v41 n10 p1193-1195 Oct 70.

Descriptors: (*Addiction, *Memory), (*Aviation safety, *Alcohols), Behavior, Pilots, Mental disorders, Aviation medicine.
Identifiers: *Alcohol intoxication.

Alcohol most severely disrupts short-term memory in man. This is briefly presented in terms of social drinking, state-dependent learning, alcohol amnesia, the Wernicke-Korsakoff syndrome and pathological alcoholic intoxication. The implications of the latter are discussed in terms of flying safety. (Author)
AD-713 611

AEROMEDICAL CONSULTATION SERVICE CASE REPORTS: OCCIPITAL MIGRAINE,
School of Aerospace Medicine Brooks AFB Tex
Paul L. Richter, and William H. King. Jun 70, 5p Rept no. SAM-TR-70-271
Availability: Pub. in Aerospace Medicine, v41 n10 p1190-1192 Oct 70.

Descriptors: (*Head, Pain), Aviation medicine, Pilots, Diagnosis, Medicine, History, Medical examination.
Identifiers: *Headache.

Migraine presenting as pain in the occipital region can be a difficult diagnostic problem. Three illustrative cases evaluated at the USAF School of Aerospace Medicine are reviewed. In two, subarachnoid hemorrhage was initially suspected. In the third, symptoms had been attributed to labile hypertension or spasm of cervical musculature. Factors supporting the diagnosis of migraine and influencing the disposition regarding flying status are discussed. (Author)
AD-713 630

CAPILLARIA OVA IN HUMAN SPUTUM,
Naval Medical Research Unit No 2 Taipei (Taiwan)
J. C. Liu, G. E. Whalen, and J. H. Cross. 17 Sep 69, 9p Rept no. NAMRU-2-TR-401 NAVMED-MR005.20.01-0098-82
Availability: Pub. in Jnl. of the Formosan Medical Association, v69 n2 p80-82, 28 Feb 70.

Descriptors: (*Nematodes, *Parasitic diseases), Humans, Body fluids, Taiwan, Eggs.
Identifiers: *Capillaria hepatica.

During a survey for paragonimiasis in Northern Taiwan, capillariid eggs were found in the sputum of a middle-aged woman. The eggs were similar in appearance to those of Capillaria hepatica. Upon examination the woman was found to be in good health except for an eosinophilia. It is not known

whether this was a spurious or a sublinical infection. (Author)
AD-713 653

EMERGENCY TREATMENT OF BURNS,
Brooke Army Medical Center Fort Sam Houston Tex
Bruce E. Zawacki, and Basil A. Pruitt. 1970, 10p
Availability: Pub. in American Family Physician/GP, v2 n1 p60-68 Jul 70.

Descriptors: (*Burns, Therapy), Diagnosis, Aging (Physiology), Medical examination, Pain, Respiratory system, Pathology, Edema.
Identifiers: *First aid.

Initial evaluation will determine whether the patient has a minor burn, which may be treated on an outpatient basis, a moderate burn, which should be treated in the community hospital, or a critical burn, and should be admitted to a major hospital with specialized facilities. Attention is then focused on fluid therapy, wound care, respiratory complications, alleviation of anxiety and pain, prevention of limb ischemia and problems of transporting the critically burned patient. (Author)
AD-713 657

RECENT ADVANCES IN BURN TREATMENT,
Brooke Army Medical Center Fort Sam Houston Tex Army Inst of Surgical Research
Basil A. Pruitt, Jr. 9 Mar 70, 8p
Availability: Pub. in Surgery, v68 n2 p412-418 Aug 70.

Descriptors: (*Burns, Therapy), Reviews, Wounds + injuries, Septicemia, Cardiovascular system, Pathology, Respiratory system, Physiology, Hypoxia, Rheology, Blood circulation, Blood coagulation, Microorganisms, Antibiotics.

Five main areas of burn care are discussed: initial resuscitation, sepsis in the burn patient, care of the burn wound, coverage of the burn wound, and complications of thermal injury.
AD-713 783

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER. SELF-AID, FIRST AID AND EVACUATION.
Research By-Product,
George Washington Univ Alexandria Va Human Resources Research Office
Elizabeth Y. Felton, T. O. Jacobs, and Kenneth Perkinson. Jan 69, 50p
Contract DA-44-188-ARO-2

Descriptors: (*Medical supplies, Army training), (*Combat surveillance, Army training), (*Infantry, Leadership), Battle injuries, Evacuation, Performance (Human), Warfare, Instruction manuals.
Identifiers: *Infantry rifle squad leaders, *First aid.

The performances, knowledges, and skills required of the Infantry rifle squad leader to treat himself or his men and to supervise treatment and evacuation are covered in this paper. Skills and knowledges include the lifesaver steps; treating wounds requiring special first aid measures; such as chest, head, belly and jaw wounds and fractures; administration of morphine; treatment for common emergencies, such as snake bites, foreign objects in eye, ears, nose, and throat, blisters, unconsciousness, drowning, electric shock, minor cuts and burns; treatment for severe burns; administration of artificial respiration; administration of closed chest cardiac massage; and evacuation of wounded. (Author)
AD-713 805 HC$3.00 MF$0.65

ELECTRIC INJURY,
Brooke Army Medical Center Fort Sam Houston Tex
Basil A. Pruitt, Jr., and John A. Moncrief. 1970, 7p
Availability: Pub. in Postgraduate Medicine, v48 n3 p189-194 Sep 70.

Descriptors: (*Wounds + injuries, Electricity), Tissues (Biology), Burns, Shock (Pathology), Cardiovascular system, Respiratory system, Electric currents, Pathology, Skin, Damage, Therapy, Necrosis, Surgery, Mortality rates, Muscles.
Identifiers: *Electrical shock.

[illegible] in the infrequent minor case, electric injury is characterized by full-thickness, sharply demarcated, rather limited skin loss and extensive, frequently inapparent destruction of deeper tissues. Vigorous early fluid administration commonly exceeding the estimated requirements is essential, and prophylactic use of an osmotic diuretic is recommended to prevent development of acute renal failure. Because of injury to and subsequent edema formation in tissues contained within the investing fascia, fasciotomy of an involved limb is frequently necessary. Progressive tissue necrosis is the rule and demands close observation and repeated surgical debridement in conjunction with effective topical antibacterial therapy. Complications are common, compounding the initial injury and resulting in high morbidity and mortality. (Author)
AD-713 820

CELL MIGRATION AND PROLIFERATION DURING REPAIR OF SUPERFICIAL CORNEAL WOUNDS PRODUCED BY A CARBON DIOXIDE LASER.
School of Aerospace Medicine Brooks AFB Tex
For primary bibliographic entry see Field 6P.
AD-713 831 HC$3.00 MF$0.65

TISSUE CHANGES FOLLOWING VENOUS OCCLUSION USING PHOTON ABSORPTIOMETRY,
Wisconsin Univ., Madison
Richard B. Mazess. 1970, 3p

Descriptors: (*Tissues (Biology), Blood circulation), (*Blood vessels, Vasoconstricting), Blood pressure, Absorptiometers, Pressure measurement, Body fluids.
Identifiers: *Venous occlusion.

For abstract, see NSA 24 20.
COO-1422-76 HC$3.00 MF$0.65

THE BONE MINERAL CONTENT OF THE PHALANX OF CHRONIC HEMODIALYSIS PATIENTS,
Wisconsin Univ., Madison.
Philip F. Judy, G. J. Beirne, and J. R. Cameron. 1969, 3p

Descriptors: (*Bone diseases, Urologic diseases), (*Urologic diseases, Phalangus), (*Phalangus, Mineral deficiencies), Artifical kidneys, Dialysis, Bones.
Identifiers: *Hemodialysis.

For abstract, see NSA 24 20.
COO-1422-80 HC$3.00 MF$0.65

THE EPIDEMIOLOGY AND PROPHYLAXIS OF CHOLERA,
Joint Publications Research Service, Washington, D.C.
A. Ponomarev. 16 Oct 70, 5p
Trans. from Meditsinskaya Gazeta (USSR) p3, 22 Sep 70.

Descriptors: (*Cholera, Epidemiology), Translations, USSR, Prophylaxis, Bacterial diseases, Infectious diseases, Tropical diseases, Vibrio, Diagnosis, Serology, Public health.

The report summarizes peculiarities of the epidemiology and prophylaxis of modern cholera.
JPRS-51589 HC$3.00 MF$0.65

LABORATORY DIAGNOSIS OF CHOLERA,
Joint Publications Research Service, Washington, D.C.
For primary bibliographic entry see Field 14B.
JPRS-51605 HC$3.00 MF$0.65

CONGRESS OF MOLDAVIAN PHYSICIANS (1st) MEETS IN KISHINEV,
Joint Publications Research Service, Washington, D.C.
I. D. Sorochan. 20 Oct 70, 31p
Trans. from Sovetskaya Molodezh (USSR) p1, 19 Jun 70; p2, 21 Jun 70; p3-4, 21 Jun 70.

Descriptors: (*Public health, Meetings), Industrial hygiene, Industrial medicine, USSR, Translations.

Contents: First Congress of Moldavian Physicians opens; Speech of P. A. Paskar', Chairman of the Council of Ministers Moldavian SSR; Tasks in improving protection of the health of rural Moldavia; Everyday attention to the health of the rural worker.
JPRS-51606 HC$3.00 MF$0.65

LOCALIZATION OF ANTIBODIES IN SPONTANEOUS AND INDUCED TUMORS.
Progress rept. 1 Jul 69-30 Jun 70,
Roswell Park Memorial Inst., Buffalo, N.Y.
David Pressman. Jul 70, 5p
Contract AT (30-1)-2651

Descriptors: (*Neoplasms, *Antibodies), Antigen antibody reactions, Position (Location).

For abstract, see NSA 24 20.
NYO-2651-24 HC$3.00 MF$0.65

AEROSPACE MEDICINE AND BIOLOGY - A CONTINUING BIBLIOGRAPHY WITH INDEXES.
Informatics Tisco, Inc., College Park, Md.
Jul 70, 106p NASA-SP-7011/78/
Coll- 106 P Refs Spon- Sponsored By Nasa

Descriptors: *Aerospace medicine, *Bibliographies, *Biological effects, *Indexes (documentation), Abstracts, Aerospace environments, Manned space flight, Physiological effects, Psychological effects.

For abstract, see STAR 08 21.
N70-38293 HC$3.00 MF$0.65

INFLUENCE OF IONIZING RADIATION ON INFECTION AND IMMUNITY,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 6R.
For abstract, see NSA 24 20.
ORNL-tr-2316 HC$3.00 MF$0.65

VEHICLE SPEED AND RURAL AUTOMOTIVE CRASH INJURY. PART I: ESTIMATED TRAVELING SPEED AND FATALITIES,
Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
For primary bibliographic entry see Field 13L.
PB-194 970 HC$3.00 MF$0.65

VEHICLE SPEED AND RURAL AUTOMOTIVE CRASH INJURY. PART II: ESTIMATED TRAVELING SPEED AND INJURIES IN SINGLE VEHICLE FRONTAL CRASHES.
Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
For primary bibliographic entry see Field 13L.
PB-194 971 HC$3.00 MF$0.65

AUTOMOBILE SIDE IMPACTS AND RELATED INJURIES.
Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
For primary bibliographic entry see Field 13L.
PB-194 972 HC$3.00 MF$0.65

A COMPUTER SIMULATION MODEL FOR EVALUATION OF THE HEALTH CARE DELIVERY SYSTEM.
Final rept. 18 Apr 69-17 Apr 70,
Geomet, Inc., Rockville, Md.
George H. Milly, and Leon S. Pocinki. Jun 70, 250p HSRD-70-15
Contract HSM-110-69-86

Descriptors: (*Medical services, *Systems analysis), Computerized simulation, Data processing, Public health, Communities, Information systems, Medical records, Economic analysis, Cost estimates, Cost engineering, Medical personnel, Evaluation, Development.
Identifiers: *Health services research and development, *Health care delivery systems.

The report is phase 1 in the development of a ranked set of viable alternative health care delivery systems. The goal for this first year's effort was the development of a structure for a simulation model of the health care delivery system. Results of the following specific tasks are described: establishing an interdisciplinary team, model building, and data acquisition and processing. This report also proposes the application of systems analysis techniques to the development and testing of alternative health care delivery systems. The report demonstrates the feasibility of developing evaluation methods, including a simulation model, the definition of system boundaries, the community, and external constraints. For each major element of the system: population, the delivery system, costs, and finance, a conceptual model has been developed with input requirements and resulting outputs. Conceptual case-types are presented. The physical unit of the system is defined as a service-treatment station, and this concept is explored in detail. (NCHSRD abstract)
PB-195 132 HC$3.00 MF$0.65

MEGAKARYOCYTOPOIETIC RESPONSE TO PLATELET DEPLETION.
Doctoral thesis,
Rochester Univ., N.Y. School of Medicine and Dentistry.
Alexander Nakeff. 1970, 146p

Descriptors: (*Thrombocytopenia, *Hematopoiesis), (*Bone marrow, *Platelets), Hematology, Hematopoietic systems, Cells (Biology).
Identifiers: *Megakaryocytes.

For abstract, see NSA 24 20.
UR-49-1332 HC$3.00 MF$0.65

6F. Environmental Biology

LITTER ACCUMULATION IN SELECTED FORESTS OF THE REPUBLIC OF PANAMA,
Duke Univ Durham N C School of Forestry
Carl M. Gallegos, and Frank W. Woods. 1970, 8p
AROD-7382:1-EN
Grant DA-ARO (D)-31-124-G938
Availability: Pub. in Biotropica, v2 n1 p46-50 1970.

Descriptors: (*Jungles, *Ecology), Periodic variations, Climatology, Organic materials, Energy, Calorimetry, Panama.
Identifiers: Ecosystem productivity, *Forest floor litter.

Accumulated litter was collected from primary and secondary tropical moist forests, and from a primary, premontane wet forest in Panama during June to August 1967 (wet-season months), and in January 1968 (a dry-season month). Weights of litter and caloric contents were greatest in the premontane wet forest. Litter accumulation and energy content increased during the dry season in two secondary, tropical moist forests. (Author)
AD-713 277

ECOLOGY OF JAPANESE ENCEPHALITIS VIRUS ON TAIWAN IN 1968,
Naval Medical Research Unit No 2 Taipei (Taiwan)
For primary bibliographic entry see Field 6M.
AD-713 315

OCCURRENCE OF VIBRIO PARAHAEMOLYTICUS AND RELATED HEMOLYTIC VIBRIOS IN MARINE ENVIRONMENTS OF WASHINGTON STATE,
Washington Univ Seattle Coll of Fisheries
For primary bibliographic entry see Field 6M.
AD-713 390

STUDIES ON THE BIOLOGICAL EFFECTS OF THERMAL DISCHARGES FROM NUCLEAR REACTORS TO THE COLUMBIA RIVER AT HANFORD,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
William L. Templeton, and Charles C. Coutant. 1970, 35p CONF-700810-38, SM-146/33
Contract AT (45-1)-1830
Presented at the Symposium on Environmental Aspects of Nuclear Power Stations, New York, N.Y. 10-14 Aug 70.

Descriptors: (*Rivers, Industrial wastes), (*Nuclear reactors, Heat transmission), (*Ecology, Rivers), Aquatic animals, Heat, Water pollution.
Identifiers: Columbia River, *Thermal pollution.

For abstract, see NSA 24 20.
BNWL-SA-3465 HC$3.00 MF$0.65

CHEMICAL ECOLOGY.
Geokhimicheskaya Ekologiya
Translation Consultants, Ltd., Arlington, Va.
V. V. Kovalskiy. Sep 70, 16p NASA-TT-F-13196
Contract NASW-2038
Coll- 16 P Refs Tran- Transl. Into English From the Publ. 'aiogenez I Nachalnyye Stadii Evolyutsii Zhizni' Moscow, Nauka Press, 1968 P 188-197

Descriptors: *Animals, *Ecology, *Geochemistry, *Plants (botany), Biochemistry, Chemical composition, Rocks, Soils.

For abstract, see STAR 08 21.
N70-38373 HC$3.00 MF$0.65

THE INTERRELATIONSHIP OF HYDRODYNAMICAL PROCESSES AND ORGANIC PRODUCTION IN THE OCEAN.
Nova Univ., Fort Lauderdale, Fla.
For primary bibliographic entry see Field 8A.
For abstract, see NSA 24 20.
ORO-3845-2 HC$3.00 MF$0.65

EFFECTS OF TEMPERATURE AND SALINITY ON THERMAL DEATH IN POSTLARVAL BROWN SHRIMP, PENAEUS AZTECUS.
Technical rept.,
Galveston Marine Lab., Tex.
David V. Aldrich, and Larry Milton Wiesepape. Oct 70, 82p TAMU-SG-71-201
Grant NSF-GH-59

Descriptors: (*Shrimps, *Temperature), (*Ecology, Shrimps), (*Salinity, Shrimps), Acclimatization, Tolerances (Physiology), Environment, Adaptation, Aquatic animals, Marine biology, Aquaculture, Life cycles, Larvae.
Identifiers: Penaeus azteus.

Lab studies were conducted on the effects of temperature and salinity on resistance of postlarval Penaeus aztecus to lethally high temperatures. Longer resistance times occurred at the higher test salinity. The lower acclimation salinity proved to be a better preparation for resisting lethal high temperatures. These results provide evidence of a new relationship between environmental salinity and the temperature tolerance of an estuarine organism. A reduction in the amount of work necessary for osmoregulation is thought to explain the higher thermal resistance at higher test salinities. Improved thermal resistance at all test salinities after acclimation at 5% is considered to be an adaptation allowing the postlarvae to resist high temperatures when they are in low salinity bays. (Author)
PB-195 175 HC$3.00 MF$0.65

THE INTERRELATION OF CARBON AND PHOSPHORUS IN REGULATING HETEROTROPHIC AND AUTOTROPHIC POPULATIONS IN AQUATIC ECOSYSTEMS.
Water pollution control research series,
Federal Water Quality Administration, Athens, Ga. National Pollutants Fate Research Program.
Pat C. Kerr, Doris F. Paris, and D. L. Brockway. Jul 70, 60p FWQA-16050-FGS-07/70 W71-00475
Presented at Purdue Industrial Wastes Conference May 6, 1970. Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $0.60 as I-67.13/4:16050-FGS-07/70.

Descriptors: (*Ecology, *Streams), (*Carbon, *Food chains), (*Phosphorus inorganic compounds, Food chains), Stream pollution, Water pollution, Algae, Fresh water biology, Nitrogen, Metabolism, Water chemistry, Water pollution, Bacteria, Aquatic biology.

Laboratory and field investigations were conducted on the fate and cycling of carbon and phosphorus in selected aquatic ecosystems. Inorganic carbon, as CO2, supplied by both bacterial cultures and cylinder gases, stimulated the growth of the blue-green alga Anacystis nidulans. Diel studies of a stream which received biologically-treated sewage demonstrated that the dissolved CO2 and HCO3 continually produced in the system were essentially depleted by the autotrophic organisms during daylight hours, while the concentration of phosphorus remained unchanged. Addition of organic carbon and inorganic nitrogen and phosphorus alone and in combination to the waters studied directly stimulated the oxidative metabolism of the heterotrophic population, which resulted in increased dissolved CO2 and HCO3. This increased availability of inorganic carbon, rather than the direct metabolic removal of dissolved phosphorus by the algae, appeared to be directly responsible for the growth of the algal populations in the waters studied. (Author)
PB-195 195 MF$0.65

6G. Escape, Rescue, and Survival

SEAMANSHIP MANUAL,
Naval Intelligence Command Alexandria Va Translation Div
For primary bibliographic entry see Field 13J.
AD-713 272 HC$3.00 MF$0.65

OBSTACLES IN OXYGEN TRANSPORT DURING AEROMEDICAL EVACUATION,
Walter Reed Army Inst of Research Washington D C
John N. Henry, Teruo Matsumoto, and George Hayes. 1970, 11p

Descriptors: (*Aviation medicine, *Evacuation), (*Aircraft cabins, *Hypoxia), (*Military personnel, *Wounds + injuries), (*Air transportation, Military personnel), Battle injuries, Respiration, Respiratory system, Pathology, Oxygen consumption, Stress (Physiology), Flight, Tolerances (Physiology), Military medicine.

Aeromedical evacuation is well tolerated by the majority of casualties evacuated from Viet Nam to Japan. Low cabin altitudes are better tolerated by all injury types. Cabin altitudes of 6,700 and above are poorly tolerated by the S.I. and V.S.I. (22% of

all evacuees). The most hypoxemic patients during flight were those with fractured femurs, multiple extremity fractures and abdominal cases. The lowest tolerance to flight was observed in those who were very seriously injured, regardless of the injury sustained, those with burns, sepsis and patients with chest injuries. Primary determinants of hypoxemia were cabin altitude and preflight pulmonary insufficiency. Of significance but of secondary importance were the patient's level of anemia, low serum osmolality and the type, seriousness and complications of injury. (Author)
AD-713 537 HC$3.00 MF$0.65

CITY OF NEW YORK EMERGENCY AMBULANCE SERVICE DEMONSTRATION PROJECT,
New York City Office of the Mayor. Office of Administration.
Leonora Burkholz. Apr 70, 137p* DOT-HS-800 307
Contract FH-11-6930

Descriptors: (*Ambulances, *New York), (*Medical services, Project planning), Systems management, Computerized simulation, Mathematical models, Computer programming, Flow charting, Telecommunication, Time, Policies, Management planning, Pattern recognition, Data processing.
Identifiers: Emergency ambulance service, Demonstration projects, New York City (New York), Evaluation.

The objectives of the New York City emergency ambulance demonstration project were to: Test and evaluate the use of a mathematical model developed to simulate emergency ambulance service operations; develop, test and evaluate computer programs which can take ambulance call data and affix to each call the geographic coordinates of that call; develop, test and evaluate computer programs to prepare maps of call distributions; collect operating data before and after implementing a change in operating policy in order to provide the environmental descriptors for the model, to compare the model's predictions to the observed performance of the ambulance system and to test operating policy changes essential to a dispersed ambulance system; and integrate the findings into a generalized system for use by other urban areas. (Author)
PB-195 053 HC$3.00 MF$0.65

DISPERSAL OF EMERGENCY AMBULANCES IN THE CITY OF NEW YORK: A DEMONSTRATION AND ANALYSIS,
New York City Office of the Mayor. Office of Administration.
Eugene L. Klemens, and Richard P. Kuo. Mar 70, 94p* DOT-HS-800 308
Contract FH-11-6930

Descriptors: (*Ambulances, *New York), (*Medical services, Field tests), Systems management, Predictions, Time, Effectiveness, Telecommunication, Stations, Statistical data.
Identifiers: Emergency ambulance service, Demonstration projects, New York City (New York), *Ambulance dispersal.

The document reports on the results of a field test which was conducted to determine whether dispersal of individual emergency ambulances in areas of predictably heavy demand would yield improvements in performance. A portion of the demonstration period was devoted to gathering certain time and mileage data under normal conditions of operation for four ambulances. These data were subsequently compared with similar information gathered when six of the ambulances were dispersed. In general, the test demonstrated the feasibility of ambulance dispersal. There was no loss of control of the dispersed ambulances; they were more available for assignment than under the traditional dispatch system; and their effectiveness, as measured by decreased response times, was improved. In addition, personnel involved, both ambulance crews and dispatch personnel, demonstrated their ability to adjust to the new procedures. (Author)
PB-195 054 HC$3.00 MF$0.65

6H. Food

ALTERATION OF TASTE QUALITIES THROUGH NATURAL PRODUCTS,
Army Natick Labs Mass
For primary bibliographic entry see Field 6P.
AD-713 510 HC$3.00 MF$0.65

NEW FOODS FOR MILITARY USE. A PHYSICO-CHEMICAL APPROACH TO RESEARCH AND DEVELOPMENT,
Army Natick Labs Mass Food Lab
John G. Kapsalis, John E. Walker, Jr., and Max Wolf. 1970, 14p*

Descriptors: (*Dehydrated foods, *Moisture), (*Degradation, Dehydrated foods), Absorption, Thermodynamics, Brittleness, Hardness, Fragmentation.
Identifiers: Texture.

Low and intermediate moisture foods have proved to be one of the most valuable of the various types of processed foods used in special combat feeding situations. One of the most complex problems that arises with such products is deterioration in texture. Brittleness, dryness, or excessive hardness are typical of the unwelcome textural changes that may occur. A related problem is the fragmentation and pulverization of leafy or fibrous dried foods which occur during storage and transportation. In the investigation here reported, a basic understanding of the relationships between the sorption of water and textural properties was sought. A thermodynamic approach to describing and interpreting the structural alterations that occur is set forth, and suggestions are made regarding how the findings can be utilized in tailoring the textural properties of dry foods to meet specific military needs. (Author)
AD-713 549 HC$3.00 MF$0.65

DETERMINATION OF ALPHA-TOCOPHEROL IN FREEZE-DRIED FOODS BY A MODIFIED COLORIMETRIC PROCEDURE.
School of Aerospace Medicine Brooks AFB Tex
For primary bibliographic entry see Field 7D.
AD-713 829 HC$3.00 MF$0.65

EVALUATION OF AN EXPERIMENTAL FISH REDUCTION PROCESS APPLICABLE TO SMALL FISHERIES.
Bureau of Commercial Fisheries, Ann Arbor, Mich.

Jul 70, 165p* EDACOMM-70-012

Descriptors: (*Economic development, Fisheries), (*Fresh water fishes, Processing), Aquatic animals, Pesticides, Removal, Cost analysis, Feeding stuffs, Animal nutrition, Production capacity, Market research.
Identifiers: *Mink industry, Fishcare, Pressfish, Technical assistance projects.

The study is concerned with use of freshwater fish for mink food. Feeding trails with presscake are described. Recommendations indicate that presscake offers considerable promise in the mink industry. Additional research is recommended. An implementation program makes technical assistance available to anyone showing interest in production or use of presscake. (BCF abstract).
PB-195 052 HC$3.00 MF$0.65

THE ECONOMICS OF FISH PROTEIN CONCENTRATE.
Massachusetts Inst. of Tech., Cambridge.

Sep 70, 202p* MSC-71-69

Descriptors: (*Fish protein concentrates, *Economic analysis), (*Developing countries, Fish protein concentrates), Cost estimates, Nutritive value, Food habits, International trade, Chile, Capital, Infant nutrition, Fishing.

The report examines the economic feasibility of fish protein concentrate (FPC) in two contexts: (1) As a nutritional supplement in the diet of a developing country; and (2) as a competitive food additive in the United States. These subjects are examined with special reference to the role that the United States Government should play in the development of FPC. The Report recommends that: Efforts to tie the FPC program to the domestic fisheries should be resisted; a reasoned, broadbased program of research into the basic technology of FPC is one of the better investments that the U.S. could presently make, and that such a program should be supported and strengthened; and the Aberdeen, Washington pilot scale FPC processing plant should be developed into a flexible, pilot scale testing center for a variety of processes and combinations of processes. A bibliography of 113 references is included. (Author)
PB-195 226 HC$3.00 MF$0.65

6I. Hygiene and Sanitation

IMPRESSION MATERIAL STERILIZATION WITH GASEOUS ETHYLENE OXIDE,
Naval Dental School Bethesda Md
For primary bibliographic entry see Field 6L.
AD-713 118 HC$3.00 MF$0.65

6J. Industrial (Occupational) Medicine

MORTALITY EXPERIENCE OF URANIUM AND NONURANIUM WORKERS,
Union Carbide Corp., Oak Ridge, Tenn. Y-12 Plant.
L. M. Scott, K. W. Bahler, A. de la Garza, and T. A. Lincoln. 31 Jul 70, 12p
Contract W-7405-eng-26

Descriptors: (*Industrial medicine, Uranium), (*Uranium, Mortality), Radioactive isotopes, Public health, Nuclear power plants.

For abstract, see NSA 24 20.
Y-1739 HC$3.00 MF$0.65

6K. Life Support

A CRYOGENIC LIFE SUPPORT SYSTEM FOR SUBMERGED HABITATS.
Final rept.,
Airco Cryogenics Irvine Calif
Duane A. Bergmann. 28 Oct 68, 36p
Contract N00014-67-C-0095

Descriptors: (*Life support, *Deep submergence), Underwater vehicles, Respiration, Oxygen, Carbon monoxide, Methane, Carbon dioxide, Models (Simulations), Confined environments.
Identifiers: *Manned submersibles, Sealab 1 manned submersible, Decompression chambers, *Cryogenic life support systems, Liquid oxygen, Liquid hydrogen.

A cryogenic life support system utilizing liquid oxygen and liquid hydrogen was designed, fabricated and tested. The system performs the following life support functions: (1) supplies breathing oxygen; (2) provides space heating; (3) converts carbon monoxide to carbon dioxide. System testing was performed in Sealab Deck Decompression chamber (DDC) at Airco Cryogenics and submerged tests were performed in Sealab I -STEP at United States Navy Mine Defense Laboratory (USN MDL) Panama City, Florida. (Author)
AD-713 182 HC$3.00 MF$0.65

LOW-PRESSURE COMPRESSED AIR BREATHING SYSTEMS STUDY. II. MARK V HELMET VENTILATION STUDIES.
Summary technical rept. 1 Apr-1 Aug 70,
Battelle Memorial Inst Columbus Ohio Columbus Labs
Jerry A. Henkener. 22 Sep 70, 52p
Contract N00014-69-C-0352

Descriptors: (*Low-pressure research, *Breathing apparatus), (*Helmets, Diving), (*Diving, Breathing apparatus), Underwater clothing, Ventilation, Carbon dioxide, Effectiveness, Respiration, Experimental data, Pressure breathing.
Identifiers: Mark-5 helmets, *Diving helmets, *Low pressure breathing apparatus.

This report presents experimental results of a testing program for determining mixing effectiveness factors and required ventilation rates for U. S. Navy Mark V diving helmets. Based upon the experimental results and data the following are concluded: Previous ventilation calculations based on a mixing effectiveness factor of 1.0 were conservative; a data base was obtained to more accurately predict required ventilation rates for hard hat diving; The data base for the Mark V should prove to be a valuable tool for comparing the effectiveness of other ventilated helmets. (Author)
AD-713 395 HC$3.00 MF$0.65

DETAILED STUDY OF CONTAMINANT PRODUCTION IN A SPACE CABIN SIMULATOR AT 258 MM. MERCURY,
School of Aerospace Medicine Brooks AFB Tex
J. P. Conkle, J. D. Adams, W. E. Mabson, P. Wolf, and H. J. Zeft. May 70, 10p Rept no. SAM-TR-70-263
Availability: Pub. in Aerospace Medicine, v41 n9 p1031-1038 Sep 70.

Descriptors: (*Confined environments, Air pollution), (*Space simulation chambers, Air pollution), Spacecraft cabins, Gas analysis, Concentration (Chemistry), Life support, Spacecraft, Charcoal, Nitrogen oxides, Carboxylic acids, Alcohols, Aldehydes, Aromatic compounds, Amines, Esters, Ethers, Halogenated hydrocarbons, Carbon monoxide.
Identifiers: *Atmosphere contamination control.

Additional information has been accumulated concerning the contaminants associated with habitation by man of a closed confined space. An experiment designed to determine man's contribution to trace contaminants was conducted. The experiment was divided into three phases: an unmanned period, a manned period, and a manned period coupled with an activated carbon scrubber. Direct analyses of the sealed environment were not adequate for this comprehensive survey; however, cryogenic fractionation and concentration provided samples with sufficient concentration of contaminants for analysis by means of gas chromatography, infrared spectroscopy, and mass spectroscopy. Of the 142 compounds identified and quantified during the experiment, only 45 were found during the manned phases. (Author)
AD-713 613

TRACE CONTAMINANT ADSORPTION AND SORBENT REGENERATION.
Lockheed Missiles and Space Co., Palo Alto, Calif.
C. R. Arnold, G. J. Kersels, R. P. Merrill, A. J. Robell, and A. Wheeler. Sep 70, 290p NASA-CR-1582, LMSC-L-62-69-1
Contract NAS1-5847
Coll- 290 P Refs

Descriptors: *Adsorption, *Desorption, *Regeneration (engineering), *Spacecraft cabins, *Trace contaminants, Carbon, Manned space flight, Systems engineering.

For abstract, see STAR 08 21.
N70-38501 HC$3.00 MF$0.65

6L. Medical and Hospital Equipment

IMPRESSION MATERIAL STERILIZATION WITH GASEOUS ETHYLENE OXIDE,
Naval Dental School Bethesda Md
D. N. Firtell, D. J. Moore, and G. B. Pelleu, Jr. 1 Sep 70, 9p Rept no. NDS-TR-017

Descriptors: (*Dentistry, Sterilization), (*Sterilization, *Ethylene oxide), Gases, Materials, Colloids, Physical properties, Effectiveness, Biological contamination, Bacillus subtilis, Bacteria.
Identifiers: *Dental materials.

The increase in surgical treatment of oral, facial, and cranial defects has prompted a concomitant increase in requests for impressions to be made in the surgical theater. To avoid violation of the sterile chain, impression materials and equipment should be sterile. Irreversible hydrocolloid and plaster materials are practical for use in the operating room but cannot be sterilized by autoclaving and other high temperature methods; and whether they are sterile as received from the manufacturer is questionable. The purpose of this study was to determine the effectiveness of gaseous ethylene oxide treatment in sterilizing hydrocolloid powder and fast-setting plaster; and to determine the effect of the procedure on the physical properties of the hydrocolloid. Both materials were found to be contaminated with gram-positive bacilli and cocci as received from the manufacturer. There was no significant difference between setting times and linear measurements of sterilized and nonsterilized samples. (Author)
AD-713 118 HC$3.00 MF$0.65

RESEARCH ACTIVITIES IN THE FIELD OF MATERIALS SCIENCE.
North Carolina Univ Chapel Hill Materials Research Center
For primary bibliographic entry see Field 11G.
AD-713 198 HC$3.00 MF$0.65

BONE MARROW PRESERVATION.
Final scientific progress rept.
Institute of Medical Sciences San Francisco Calif

1970, 10P
Contract Nonr-3168 (00)

Descriptors: (*Bone marrow, Preservation), Transplantation, Freezing, Viability, Efficiency, Effectiveness, Pyrroles, Sulfoxides, Glycerols.
Identifiers: Cryobiology, Tissue preservation.

A summary is provided of work which was designed to study the preservation and transplantation of bone marrow at low temperatures, employing different freezing velocities, different cryopreservative agents, and different methods for assessing the viability of preserved marrow.
AD-713 216 HC$3.00 MF$0.65

PROPERTIES OF n-BUTYL-alpha-CYANOACRYLATE RESTORATIVE MATERIALS,
Walter Reed Army Medical Center Washington D C Army Inst of Dental Research
For primary bibliographic entry see Field 11A.
AD-713 516 HC$3.00 MF$0.65

FEASIBILITY STUDY AUTOMATED MEDICAL EXAMINING SYSTEM STATE OF THE ART SURVEY - MEDICAL.
Rept. on Phase 1, 1 Dec 69-29 May 70.
Philco-Ford Corp Palo Alto Calif Western Development Labs

Sep 70, 157p* Rept no. WDL-TR-4173-May-70
SAM-TR-70-83
Contract F41609-70-C-0012
See also AD-713 656.

Descriptors: (*Medical examination, Automation), (*Medical equipment, State-of-the-art reviews), Feasibility studies, Test methods, Medical laboratories, Data processing systems, Computers, Medical personnel, Costs, Reliability, Efficiency.

The survey was conducted to identify all existing equipment and procedures capable of accomplishing recommended improvements in the Armed Forces Entrance and Examination Stations (AFEES) physical examination. This survey classifies the alternative devices or procedures which should be considered for each AFEES medical function in order of estimated merit based upon such factors as cost, reliability, maintainability, personnel requirements, data handling requirements, and resistance to malingering. (Author)
AD-713 655 HC$3.00 MF$0.65

FEASIBILITY STUDY AUTOMATED MEDICAL EXAMINING SYSTEM STATE-OF-THE-ART SURVEY - DATA PROCESSING EQUIPMENT.
Rept. on Phase 1, 1 Dec 69-25 Aug 70.
Philco-Ford Corp Palo Alto Calif Western Development Labs
Sep 70, 114p* Rept no. WDL-TR-4173-Aug-70
SAM-TR-70-84
Contract F41609-70-C-0012
See also AD-713 655.

Descriptors: (*Data processing systems, State-of-the-art reviews), (*Medical examination, Automation), Computers, Feasibility studies, Computer program, Data storage systems, Costs, Reliability, Maintenance, Efficiency.

The survey was conducted to identify all existing equipment and procedures capable of accomplishing recommended improvements in Armed Forces Entrance and Examination Station operations. This survey classifies the alternative devices or procedures which should be considered for each AFEES data handling function in order of estimated merit based upon such factors as cost, reliability, maintainability and personnel requirements. (Author)
AD-713 656 HC$3.00 MF$0.65

AUTOMATED SYSTEM OF MEDICAL DATA PROCESSING,
Joint Publications Research Service, Washington, D.C.
M. H. Zaitsev, S. Y. Zaslavskii, A. O. Popov, V. H. Melnykov, and V. O. Shulha. 19 Oct 70, 18p
Trans. of Akademiya Nauk USSR, Kiev. Visnyk, v34 n8 p76-87 1970.

Descriptors: (*Medical records, *Data processing), Hospitals, Feasibility, Medical personnel, Data storage, Data processing equipment, Information theory, Translations, USSR, Automation, Computers.
Identifiers: *Medical data processing.

Automated systems of processing necessary medical data exist today in many countries. The need for such systems arises from the fact that treatment facilities deal with a colossal volume of information pertaining to various stages of the healing process. A large amount of such information gives a fairly accurate picture of the pathological process, facilitating successful treatment, but on the other makes it physically impossible for a doctor to analyze it within a short time. An automated centralized data processing system for various departments in hospitals or medical complexes will promote better treatment for patients, will raise the efficiency of out-patient clinics, poly-clinics, medical dispensaries, etc., and will solve many organizational problems associated with efficient functioning of treatment centers. The general principles of the structure and components of an automated data processing system for use in medicine is examined. (Author)
JPRS-51598 HC$3.00 MF$0.65

ACCEPTANCE OF DECENTRALIZATION IN THE PENNSYLVANIA HEALTH DEPARTMENT.
Research rept. no. 1, 1967-1970,
Pennsylvania State Univ., University Park. Dept. of Sociology.
William G. Mather. Sep 70, 107p HSRD-70-25
Grant PHS-CH-00275

Descriptors: (*State government, *Medical services), (*Public health, Management analysis), (*Management engineering, Management analysis), Interviews, Questionnaires, Medical personnel, Attitudes, Opinions, Pennsylvania, Decentralization (Dispersal).
Identifiers: *Pennsylvania Department of Health, *Health services research and development.

The study was an effort to discover how decentralization of the Pennsylvania Health Department was being received by its personnel. Personal interviews were held with regional administrators and administrators in the central office. They were asked the judgement of the relationships between central and regional operations, and the extent to which the goal of more efficient local service had been attained. To determine, if possible, what factors were associated with desires for participation in decision making by the general personnel, questionnaires were distributed to all the employees above clerical and maintenance rank. The rate of return was 72.7 percent. (Author)
PB-195 148 HC$3.00 MF$0.65

HOSPITAL DISCHARGE DATA. REPORT OF THE CONFERENCE ON HOSPITAL DISCHARGE ABSTRACTS SYSTEMS HELD AT AIRLIE HOUSE, WARRENTON, VIRGINIA, JUNE 18-20, 1969.
Rept. for 12 May 69-11 May 70,
Johns Hopkins Univ., Baltimore, Md. Dept. of Medical Care and Hospitals.
Jane H. Murnaghan, and Kerr L. White. Oct 70, 222p* HSRD-70-29
Contract PHS-HSM-110-69-75

Descriptors: (*Hospitals, Medical records), (*Medical records, Data processing), (*Medical services, Meetings), Statistical analysis, Surveys, Hospitalizing, Patients, Cost control.
Identifiers: *Hospital discharge data, *Health care systems, *Health information systems, *National health bill, *Patient care data, Management information systems, Hospital discharge abstract systems, *Health services research and development.

The purpose of the Conference on Hospital Discharge Abstract Systems was to explore ways for improving and coordinating health information systems in the United States. For a number of reasons, hospital discharge data - that is, summary information about the individual patient and his episode of illness in the short-term general hospital - appeared the logical place to begin and was chosen as the main topic of the Conference. (Author)
PB-195 266 HC$3.00 MF$0.65

RADIOISOTOPE-POWERED CARDIAC PACEMAKER PROGRAM.
Quarterly progress rept. for phase II.
Nuclear Materials and Equipment Corp., Apollo, Pa. Energy Conversion Div.

30 Jun 70, 31p NUMEC-4189-1
Contract AT (30-1)-4189

Descriptors: (*Mechanical hearts, *Radioisotope batteries), Performance evaluation, Engineering, Engineering costs, Design.
Identifiers: *Cardiac pacemakers.

For abstract, see NSA 24 20.
TID-25464 HC$3.00 MF$0.65

6M. Microbiology

ECOLOGY OF JAPANESE ENCEPHALITIS VIRUS ON TAIWAN IN 1968,
Naval Medical Research Unit No 2 Taipei (Taiwan)
Roger Detels, Merrill D. Cates, John H. Cross, George S. Irving, and Raymond H. Watten. 2 Dec 69, 13p Rept no. NAMRU-2-TR-402
Availability: Pub. in American Jnl. of Tropical Medicine and Hygiene, v19 n4 p716-723 Jul 70.

Descriptors: (*Japanese B encephalitis virus, Taiwan), (*Ecology, Japanese B encephalitis virus), Disease vectors, Viruses, Arboviruses, Infections, Humans, Culicidae, Birds, Serodiagnosis, Antigens + antibodies.
Identifiers: Culex annulus.

This study was designed to investigate (1) the role of Black-crowned Night Herons (BCNH) in the dissemination of Japanese encephalitis virus, (2) to investigate the mosquito vectors that participate in the annual epidemic, and (3) to determine the chronology of infection in Herons, mosquitoes, and man in the area of a heronry in Taiwan during 1967 and 1968. Cases in man were serologically confirmed. Although the arrival of the Herons and the prevalence of mosquitoes paralleled previous years, the epidemic was 2 months later than usual. Infection was found first in pigs in late July, then in man and Herons, and last in mosquitoes in mid-August. Culex annulus (Theobald) was the most prevalent mosquito and the source of three of the five pools yielding virus. The results suggest that C. annulus (Theobald) is the principal mosquito vector of Japanese encephalitis virus, and that BCNH did not bring the virus to Taiwan. However, the sequence of infection suggests that mosquitoes thus far implicated were not the initial vector. Thus this study raises the question of undetermined insect and animal vectors in the dissemination of JE virus. (Author)
AD-713 315

THE ROLE OF SULFHYDRYL GROUPS IN THE ACTIVITY OF TYPE A BOTULINUM TOXIN,
Fort Detrick Frederick Md
For primary bibliographic entry see Field 6A.
AD-713 326

OCCURRENCE OF VIBRIO PARAHAEMOLYTICUS AND RELATED HEMOLYTIC VIBRIOS IN MARINE ENVIRONMENTS OF WASHINGTON STATE,
Washington Univ Seattle Coll of Fisheries
J. Baross, and J. Liston. 23 Mar 70, 9p Rept no. Contrib-324
Contract Nonr-477 (41)
Availability: Pub. in Applied Microbiology, v20 n2 p179-186 Aug 70.

Descriptors: (*Vibrio, *Marine biology), Washington (State), Bacteria, Infections, Seacoast, Pelecypoda, Ecology, Biological contamination, Aquatic animals.
Identifiers: *Marine microorganisms, *Aquatic microbiology, Vibrio parahaemolyticus.

Samples of sediment, water, and fauna were tested for the presence of Vibrio parahaemolyticus and the related biotype V. alginolyticus. Altogether, 379 samples were analyzed quantitatively by using a starch-agar medium. Invertebrate and sediment samples were invariably positive for V. parahaemolyticus, whereas water samples were quite variable. Samples of the Pacific oyster (C ASSOSTREA GIGAS), obtained on a regular basis for 26 months from a single environment, showed a close correlation between total numbers of mesophilic vibrios and the overlying water temperature; the seasonal counts of oysters ranged from less than 10 to greater than 100,000 per g. Ecological implications and possible pathogenicity of these vibrios are discussed. (Author)
AD-713 390

LYMPH PRODUCTION DURING STAPHYLOCOCCIC B ENTEROTOXEMIA-INDUCED SHOCK IN MONKEYS,
Army Medical Research Inst of Infectious Diseases Frederick Md
For primary bibliographic entry see Field 6E.
AD-713 400

THE INFLUENCE OF ALTERED VIRAL VIRULENCE ON THE RESPONSE OF HOST SERUM ALPHA GLYCOGLOBULINS,
Army Medical Research Inst of Infectious Diseases Frederick Md
For primary bibliographic entry see Field 6A.
AD-713 401

THE EFFECT OF PROTEOLYTIC ENZYMES ON THE ACTIVATION OF Cl. perfringens PROTOTOXIN, TYPES D AND E (Deistvie Proteoliticheskikh Fermentov na Aktivatsiyu Prototoksinov Cl. Perfringens Tipov D i E),
Army Foreign Science and Technology Center Washington D C
E. P. Zemlyanitskaya, and K. I. Matveev. 26 Jul 70, 9p Rept no. FSTC-HT-23-635-70
Trans. of Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii (USSR) v46 n8 p57-60 1969.

Descriptors: (*Clostridium perfringens, *Peptide hydrolases), Toxins + antitoxins, Enzymes, Infections, Fungi, Fermentation, Bacteria.
Identifiers: Translations.

A study was made of the action of microbial and fungal proteolytic enzymes on the activation of Cl. perfringens D and E of specified strains. An activating effect of the fungus in microbial proteolytic enzymes on the D and E prototoxins was revealed. The results indicated that in gas gangrene caused by Cl. perfringens D and E a possible non-specific activation of prototoxins of specified bacteria and aggravation of the infectious process may occur. (Author)
AD-713 472 HC$3.00 MF$0.65

OBSERVATIONS ON EARLY DETECTION AND THERAPY OF THE DEFIBRINATION SYNDROME IN MENINGOCOCCEMIA,
Madigan General Hospital Tacoma Wash
For primary bibliographic entry see Field 6E.
AD-713 560 HC$3.00 MF$0.65

INVESTIGATION OF A NEW DISEASE OF MILITARY DOGS,
Walter Reed Army Inst of Research Washington D C
For primary bibliographic entry see Field 2E.
AD-713 566 HC$3.00 MF$0.65

GENETIC TRANSFORMATION IN THE GENUS PASTEURELLA,
Army Biological Labs Frederick Md
Franklin J. Tyeryar, Jr., and William D. Lawton. 1970, 10p

Descriptors: (*Pasteurella, Genetics), (*Genetics, Transformations), Bacteria, Chromosomes, Desoxyribonucleic acids, Pasteurella tularensis, Nutrition, Streptomycins, Tryptophan, Adenine.
Identifiers: Pasteurella novicida.

Streptomycin-sensitive cultures of Pasteurella novicida can be transformed by deoxyribonucleic acid (DNA) extracted from streptomycin-resistant cultures of P. novicida or P. tularensis. Similarly, cultures nutritionally dependent on tryptophan or adenine for growth can be transformed to nutritional independence for these requirements by DNA carrying the appropriate allele from P. novicida or P. tularensis. The formation of hybrid recombinants establishes the close genetic relatedness of P. novicida and P. tularensis, but the

reduced frequency of transformation observed when P. tularensis serves as the donor suggests significant differences at the molecular level. The ability of P. novicida to undergo transformation, i.e., become competent, is not restricted to a short phase of the growth cycle, but is present uniformly throughout the logarithmic and early stationary phase of growth. (Author)
AD-713 586 HC$3.00 MF$0.65

DEOXYRIBONUCLEIC ACID HETEROGENEITY BETWEEN HUMAN AND MURINE STRAINS OF CHLAMYDIA TRACHOMATIS.
Medical research interim rept.,
Naval Medical Research Inst Bethesda Md
Emilio Weiss, Stephen Schramek, Noralee N. Wilson, and Lawrence W.Newman. 8 Apr 70, 8p
NAVMED-MR005.05.01-007BA6H1-23
Availability: Pub. in Infection and Immunity, v2 n1 p24-28 Jul 70.

Descriptors: (*Chlamydia trachomatis, *Desoxyribonucleic acids), Classification, Identification, Humans, Mice, Glucose, Metabolism, Genetics, Thermal stability, Molecular structure, Rickettsiales, Molecular properties.

The polynucleotide sequence relationships of three strains of Chlamydia trachomatis of human origin (MRC-1/G, TW-3, and Lgv), one of murine origin (MoPn), and the MN strain of C. psittaci were compared. The four strains of C. trachomatis have the same base ratio, about 42.5 moles percent guanine plus cytosine, which is significantly higher than the base ratio of MN (39.5). Single strands of deoxyribonucleic acid (DNA) fragments of MRC-1/G reassociated with immobilized DNA of TW-3 and Lgv almost as well as with the homologous DNA. The duplexes produced in these reactions were about equally thermostable. On the other hand, reassociations between MRC-1/G and MoPn involved 60 or 30% of the DNA, depending on the stringency of the conditions for reassociation, and the duplexes were thermolabile. MoPn reassociated only to a very small degree with MN. Glucose catabolism of MRC-1/G, MoPn, and Mn was compared under several sets of conditions. These tests failed to reveal any qualitative phenotypic differences among the three strains. It can be concluded that, judging by polynucleotide sequence, the three human strains of C. trachomatis are closely related but appreciably different from a murine strain. (Author)
AD-713 662

EFFECT OF DIFFERENT NITROGEN SOURCES ON THE GROWTH OF WOOD-DESTROYING FUNGI IN CULTURE (Vliyanie Razlichnikh Istochnikov Azota na Rost Derevorazrushayu Shchikh),
Army Foreign Science and Technology Center Washington D C
R. A. Maslova. 15 Oct 70, 12p Rept no. FSTC-HT-23-990-70
Trans. of Mikologiya i Fitopatologiya (USSR) v3 n5 p453-457 1969.

Descriptors: (*Basidiomycetes, *Nitrogen), (*Fungi, *Culture media), Nitrogen compounds, Metabolism, Wood, Degradation, Growth, pH, Urea, Ammonium compounds, USSR, Fermentation.
Identifiers: Translations, Polyporaceae.

In the cultivation of fungi of the family Polyporaceae on synthetic media with asparagine or urea as the only nitrogen source there is a relatively rapid growth of mycelium containing a high percentage of total nitrogen. Ammonium salts of organic acids are a good source of nitrogen for wood-destroying fungi, provided that the pH of the nutrient medium is controlled. The investigated species of Basidiomycedes cannot use nitrates as the only nitrogen source. (Author)
AD-713 752 HC$3.00 MF$0.65

LABORATORY DIAGNOSIS OF CHOLERA,
Joint Publications Research Service, Washington, D.C.
For primary bibliographic entry see Field 14B.
JPRS-51605 HC$3.00 MF$0.65

THE REVERSIBLE INHIBITION OF SPORE GERMINATION BY ALCOHOLS.
Sandia Corp., Albuquerque, N. Mex. Planetary Quarantine Dept.
N. Laible, and R. Trujillo. Aug 70, 13p NASA-CR-112964, SC-DC-70-4937
NASA ORDER W-12853
Subm- Submitted for Publication

Descriptors: *Alcohols, *Germination, *Inhibition, *Spores, Microbiology, Optical density, Plants (botany).

For abstract, see STAR 08 21.
N70-38159 HC$3.00 MF$0.65

MICROBIAL STERILIZATION IN ULTRA-HIGH VACUUM AND OUTER SPACE - A KINETIC COMPARISON.
Sandia Corp., Albuquerque, N. Mex. Planetary Quarantine Dept.
J. P. Brannen. Aug 70, 5p NASA-CR-112963
NASA ORDER W-12853
Subm- Submitted for Publication

Descriptors: *Aerospace environments, *Microorganisms, *Reaction kinetics, *Sterilization, *Ultrahigh vacuum, Activation energy, Mathematical models, Microbiology, Planetary quarantine, Pressure effects.

For abstract, see STAR 08 21.
N70-38291 HC$3.00 MF$0.65

AN ANALYSIS OF VACUUM EFFECTS IN THE STERILIZATION OF MICROORGANISMS.
Sandia Corp., Albuquerque, N. Mex. Planetary Quarantine Dept.
J. P. Brannen. Aug 70, 11p NASA-CR-112962
NASA ORDER W-12853
Subm- Submitted for Publication

Descriptors: *Microorganisms, *Planetary quarantine, *Sterilization, *Ultrahigh vacuum, Dry heat, Mathematical models, Pressure effects, Reaction kinetics, Thermodynamics.

For abstract, see STAR 08 21.
N70-38292 HC$3.00 MF$0.65

6N. Personnel Selection and Maintenance (Medical)

A STUDY OF COMFORT, HEALTH AND LEARNING IN SCHOOLS WITH DIFFERING THERMAL CONDITIONS.
Final rept.,
Dunlap and Associates, Inc., Darien, Conn.
Aug 70, 122p* ED-70-41 APTD-0590
Contract PHS-CPA-22-69-123

Descriptors: (*Schools, *Temperature control), (*Students, Performance evaluation), (*Instructors, Performance evaluation), Learning, Health, Comfort, School buildings, Temperature measurement, Statistical analysis.
Identifiers: *Climate controlled schools, Absenteeism.

The objective was to obtain data on the effects of thermal conditions on comfort (teacher and students), class behavior, student test performance and health (visits to health room and absences) in both climate controlled and non-climate controlled schools. Data were collected by teachers in three classrooms of each of six schools--two grade schools, two junior high schools, and two high schools. (Author)
PB-195 257 HC$3.00 MF$0.65

6O. Pharmacology

DECREASED DIURESIS IN RESPONSE TO A THIAZIDE DIURETIC AT A SIMULATED ALTITUDE.
Interim rept. for Jan-Mar 70,
School of Aerospace Medicine Brooks AFB Tex
Thomas S. Sulkowski, and James H. Merritt. Aug 70, 12p Rept no. SAM-TR-70-48

Descriptors: (*Diuretics, High altitude), Aviation medicine, Pilots, Effectiveness, Electrolytes, Stress (Physiology), Physiology, Pharmacology, Rats.
Identifiers: *Hydrochlorothiazide, Hypobaric medicine, Diuresis.

The effect of hydrochlorothiazide on the diuretic response of rats at 12,000 ft. was examined. After administration of a saline load, with and without drug, urine was collected over a 5-hr. period at both altitude and ground level. Total volume, urinary Na (+) and K (+), and pH were determined. The most pronounced effect of the altitude-drug interaction was decrease in the expected urine volume while the increased Na (+) output did not change from the observed with the drug at ground level. The results are discussed in relation to the possible basis for the observed phenomenon. (Author)
AD-713 069 HC$3.00 MF$0.65

SOME EFFECTS OF D-AMPHETAMINE ON CARBOHYDRATE METABOLISM AT GROUND LEVEL AND ALTITUDE.
School of Aerospace Medicine Brooks AFB Tex
For primary bibliographic entry see Field 6S.
AD-713 726 HC$3.00 MF$0.65

INTERRELATIONSHIPS OF LOW ENVIRONMENTAL TEMPERATURES ON THE ACTIONS OF DRUGS,
Toronto Univ (Ontario) Dept of Pharmacology
Gordon E. Johnson. 1969, 20p
Availability: Pub. in Physiology and Pathology of Adaptation Mechanisms, p390-409 1969. No copies furnished.

Descriptors: (*Drugs, Low-temperature research), (*Low-temperature research, *Adaptation (Physiology)), Body temperature, Atmospheric temperature, Acclimatization, Physiology, Pharmacology, Responses, Toxicity, Metabolism, Respiratory system, Cardiovascular system, Dosage, Rats, Canada.

The effect of drugs on cold-exposed rats depends on the duration of exposure prior to treatment. Immediately after exposure to cold the albino rat increases its heat production, largely through an increase in skeletal muscle activity. Since reserpine, chlorpromazine, noradrenaline, and sodium salicylate produce a fall in the metabolic rate of these animals it might be concluded that (1) these drugs in some way inhibit heat production via shivering or (2) that an increase in thermogenesis via skeletal muscle activity is not adequate enough to offset the drug-induced hypothermia. After prolonged exposure, non-shivering thermogenesis contributes a large part of the heat requirement while the contribution due to shivering is reduced. In considering the effects of drugs on thermoregulation, or the actions of drugs at any specific ambient temperature, it appears to be necessary to have information of the effects on: (1) production of heat, (2) loss of heat, (3) body temperature (balance of (1) and (2)), and (4) duration of action at existing body temperature. As usual, dose must be added to these variables. It is apparent that these factors are interdependent. From the work reported it is clear that any study of a drug must be carried out under specific thermal conditions, and when the drug alters the above parameters these too must be stated.
AD-713 740

EFFECT OF DOSE AND DURATION OF EXPOSURE ON THE TOXICITY TO DOGS OF INTRAVENOUSLY OR ORALLY ADMINISTERED 5-FLUOROURACIL.
Hazleton Labs., Inc., Falls Church, Va.
For primary bibliographic entry see Field 6T.
PB-194 852 HC$3.00 MF$0.65

ACUTE INTRAVENOUS ADMINISTRATION OF POLYVINYL-pyrrolidone 9pvp0 in rhesus monkeys.
Hazleton Labs., Inc., Falls Church, Va.
For primary bibliographic entry see Field 6T.
PB-194 853 HC$3.00 MF$0.65

COMPARATIVE TOXICITY OF A SECOND INTRAVENOUS INFUSION OF CYTOSINE ARABINOSIDE IN BEAGLE DOGS.
Hazleton Labs., Inc., Falls Church, Va.
For primary bibliographic entry see Field 6T.
PB-194 854 HC$3.00 MF$0.65

THE INJECTION OF NEWBORN MICE WITH SEVEN CHEMICAL ADJUVANTS TO HELP DETERMINE THEIR SAFETY IN USE IN BIOLOGICALS.
Wisconsin Alumni Research Foundation, Madison.
For primary bibliographic entry see Field 6T.
PB-195 153 HC$3.00 MF$0.65

TOXICOLOGY AND CARCINOGENESIS OF VARIOUS CHEMICALS USED IN THE PREPARATION OF VACCINES.
Mason Research Inst., Worcester, Mass.
For primary bibliographic entry see Field 6T.
PB-195 158 HC$3.00 MF$0.65

X-RAY STRUCTURE INVESTIGATION OF SOME SUBSTITUTED INDOLES, AND THE X-RAY CRYSTAL OF 1, 1'-BISHOMOCUBANE.
California Univ., Berkeley. Lawrence Radiation Lab.
For primary bibliographic entry see Field 20B.
For abstract, see NSA 24 20.
UCRL-19906 HC$3.00 MF$0.65

6P. Physiology

PERFORMANCE DECREMENT AS A FUNCTION OF SEVEN DAYS OF BEDREST.
School of Aerospace Medicine Brooks AFB Tex
For primary bibliographic entry see Field 5J.
AD-713 070 HC$3.00 MF$0.65

APPLICATION OF CURRENT AUDITORY DAMAGE RISK CRITERIA TO AEROSPACE OPERATIONS.
School of Aerospace Medicine Brooks AFB Tex
For primary bibliographic entry see Field 20A.
AD-713 071 HC$3.00 MF$0.65

ELECTROMECHANICAL PROPERTIES OF FRESH WHOLE BONE.
Final rept. for Jan-Aug 69,
School of Aerospace Medicine Brooks AFB Tex
Paul G. Harms, J. Ryan Neville, and Roddey L. Peebles. Sep 70, 17p Rept no. SAM-TR-70-44

Descriptors: (*Bone, Electrical properties), Deformation, Voltage, Stresses, Piezoelectric effect, Electricity, Rheology, Viscoelasticity.
Identifiers: *Bioelectricity.

Electromechanical properties of freshly excised rat femurs were studied by generation of electric potentials across the diaphysis after deformation of the bone by means of various (100-2,000 gm.) loads. The distal portion of the right femur was deformed from the long axis in posterior, anterior, lateral, and medial directions. With load application, concave areas became negatively charged and then discharged exponentially to near neutrality. A similar signal of opposite polarity ensued with load removal. Peak potentials with load application were 10% to 20% larger than those after load removal. Voltage output was related to load (posterior deformation) in a curvilinear manner, being proportional to lower loads and diminishing with the 2,000-gm. load. This decrease in voltage was associated with marked permanent deformation of the femur. Voltage and deformation caused by a 1,000-gm. load were significantly less after lateral or medial deflection than after posterior or anterior deflection. Results indicate that bone potentials are dependent upon deformation and may be related to the visco-elastic properties of bone. (Author)
AD-713 072 HC$3.00 MF$0.65

EDGE AND CURVE DETECTION FOR VISUAL SCENE ANALYSIS.
Technical rept.,
Maryland Univ College Park Computer Science Center
Azriel Rosenfeld, and Mark Thurston. Aug 70, 36p Rept nos. Scientific-1, CSC-TR-70-128 AFCRL-70-0488
Contract F19628-70-C-0208

Descriptors: (*Pictures, Optical scanning), (*Pattern recognition, Digital computers), (*Visual perception, Pictures), Curved profiles, Detection, Artificial intelligence, Anatomical models, Viewing screens, Probability, Signal-to-noise ratio.
Identifiers: Streak detection, Edge detection, Digital pictures, Spot detection, Computer graphics, *Scene analysis.

Simple sets of parallel operations are described which can be used to detect texture edges, 'spots' and 'streaks' in digitized pictures. By comparing the outputs of the operations corresponding to (e.g.) edges of different sizes, a composite output may be constructed in which edges between differently textured regions are detected, and isolated objects are also detected, but the objects composing the textures are ignored. Relationships between this class of picture processing operations and the Gestalt psychologists' laws of pictorial pattern organization are discussed. (Author)
AD-713 159 HC$3.00 MF$0.65

CATABOLIC PHASE OF HEMIN CHROMOPROTEIN METABOLISM,
Pennsylvania Univ Philadelphia Dept of Biochemistry
David L. Drabkin. 1968, 9p
Contract Nonr-551 (45)

Descriptors: (*Chromoproteins, *Metabolism), Hemoglobin, Bile pigments, Enzymes, Cytochrome oxidase, Liver, Reticulo-endothelial system, Carbon monoxide, Placenta.
Identifiers: Catabolism.

A brief summary is given of work which involved the following specific investigations: Level of output of bile pigment; Potential of hemoglobin breakdown to bile pigment; Role of haptoglobin; Breakdown of injected myoglobin, cytochrome c, denatured hemoglobin, and hematin solutions of pH 8.5 to bile pigment; Role of the liver in hemin chromoprotein breakdown; Reticuloendothelial system; Liver perfusion experiments; The hemophagous organ; A new cell-free enzyme system, prepared from the hemophagous organ and capable of degrading hemin and hemoglobin to biliverdin; and Production of carbon monoxide in the process of bile pigment production from hemin and hemoglobin.
AD-713 169 HC$3.00 MF$0.65

PARAMETERS OF HUMAN PATTERN PERCEPTION.
Texas Christian Univ Fort Worth Inst for the Study of Cognitive Systems
For primary bibliographic entry see Field 5J.
AD-713 185 HC$3.00 MF$0.65

THE NATURE OF THE EFFECT OF SET ON TACHISTOSCOPIC RECOGNITION.
Human Engineering Labs Aberdeen Proving Ground Md
For primary bibliographic entry see Field 5J.
AD-713 291 HC$3.00 MF$0.65

EFFECT OF THALAMOCORTICAL ACTIVATION ON RECRUITING RESPONSES. I. RETICULAR STIMULATION,
California Univ Los Angeles Brain Research Inst
M. Velasco, N. M. Weinberger, and D. B. Lindsley. 1968, 17p
Contract Nonr-233 (32), Grant NGL-05-007-049
Availability: Pub. in Acta Neurologia Latinoamericana, v14 p99-115 1968.

Descriptors: (*Cerebral cortex, Stimulation), (*Thalamus, Stimulation), (*Electrophysiology, *Brain), Electroencephalography, Responses, Nervous system, Physiology, Cats.

The investigations attempted to analyze the effect of activation on thalamocortical systems by means of the blocking of recruiting responses. Experiments were carried out according to the following program: (1) experiments characterizing the effect of reticular activation on cortical recruiting responses; (2) experiments comparing reticular activation with that induced by central and peripheral influences; (3) experiments determining the crucial role of the mesenphalic reticular formation on cortical activation. The results suggested that activation and arousal are a unitary phenomenon probably limited to certain synaptic events in the cortex and mediated by mesencephalic reticular, thalamic and thalamo-orbitofrontal systems.
AD-713 305

EEG CORRELATES OF REINFORCED BEHAVIORAL INHIBITION,
California Univ Los Angeles
Norman Weinberger, Lorne Yeudall, and Donald B. Lindsley. 1968, 3p
Contract Nonr-233 (32)
Availability: Pub. in Psychonomic Science, v10 n1 p11-13 1968.

Descriptors: (*Behavior, *Electroencephalography), Inhibition, Brain, Electrophysiology, Cerebral cortex, Nervous system, Physiology, Psychophysiology, Cats.

Three cats, bearing chronically implanted cortical electrodes, were trained in an instrumental vigilance situation to inhibit licking a foodcup for 15 - 25 sec prior to the onset of a stimulus signalling availability of a milk reward. Electrocortical activity following attainment of stable inhibition of licking was characteristically desynchronized, differing little from pre-inhibitory activity. On some occasions, motor quiescence was highly correlated with a 14-16/sec rhythm. However, since inhibition of licking and/or lack of movement also occurred in the absence of this waveform, it probably does not reflect neural processes necessary for behavioral inhibition. Enhanced cortical synchrony during behavioral inhibition reported by other investigators may indicate a lowering of arousal level which often accompanies behavioral inhibition rather than the neural processes underlying inhibition itself. (Author)
AD-713 307

DEVELOPMENT OF VISUALLY EVOKED POTENTIALS IN KITTENS: SPECIFIC AND NONSPECIFIC RESPONSES,
California Univ Los Angeles Brain Research Inst
Guenter H. Rose, and Donald B. Lindsley. 6 Feb 68, 17p
Contracts Nonr-233 (32), Nonr-4756 (03)
Availability: Pub. in Jnl. of Neurophysiology, v31 p607-623 1968.

Descriptors: (*Vision, Responses), (*Cerebral cortex, Vision), (*Electrophysiology, Vision), Stimulation, Physiology, Brain, Nervous system, Electroencephalography, Aging (Physiology), Cats.

The development of electrocortical evoked responses to light flash stimuli was studied in kittens as a function of age, by the use of both cross-sectional and longitudinal methods. Periodic recordings were made in the same kitten over a span of ages ranging from 4 to 56 days. Kittens were either lightly anesthetized for recording sessions or were unanesthetized and had implanted electrodes. Two separate and independent responses were identified on the basis of age of onset, polarity, latency, amplitude, cortical distribution, and their differential reactions to selective lesions. The characteristics of one of these responses, a long-latency negative wave, together with its distribution over nonvisual areas suggested its dependence on a nonspecific visual system. The nature of the other, a shorter latency response, suggested a specific visual system. It was hypothesized that the former is mediated by optic pathways to the tectum, and the latter by geniculostriate projections. The results are interpreted as confirming the hypothesis. (Author)
AD-713 308

THALAMO-CORTICAL SYSTEMS REGULATING SPINDLE BURSTS AND RECRUITING RESPONSES. I. EFFECT OF CORTICAL ABLATIONS,
California Univ Los Angeles Brain Research Inst
M. Velasco, J. E. Skinner, K. D. Asaro, and D. B. Lindsley. 15 Mar 68, 8p
Contracts Nonr-233 (32), Nonr-4756 (03)
Availability: Pub. in Electroencephalography and Clinical Neurophysiology, v25 p463-470 1968.

Descriptors: (*Electroencephalography, Cerebral cortex), (*Cerebral cortex, Nerve impulses), Electrophysiology, Thalamus, Brain, Responses, Nervous system.

The effect of various cortical ablations upon recruiting responses and spindle bursts in cats was studied in acute preparations immobilized with gallamine. Recruiting responses were induced by low frequency stimulation of the midline thalamic nuclear complex; spontaneous spindle bursts were produced by mesencephalic reticular formation lesions. Ablations of primary cortical areas (somato-senstory, auditory and visual), motor cortex and association areas, and orbito-frontal cortex were made in sequence and singly. Extensive ablations of the dorso-lateral convesity enhanced and modified both spindle bursts and recruiting responses. Only orbito-frontal cortex ablations abolished recruiting responses and spindle bursts recorded at the cortex, in the subcortical white matter, and in the thalamus. The results of these experiments suggest that the orbito-frontal cortex is an essential link in a thalamo-cortical synchronizing system responsible for spindle bursts and recruiting responses. (Author)
AD-713 311

ELECTROCORTICAL RECRUITING RESPONSES DURING CLASSICAL CONDITIONING,
California Univ Los Angeles Brain Research Inst
Norman M. Weinberger, Ken Nakayama, and Donald B. Lindsley. 3 May 67, 9p
Contracts Nonr-233 (32), Nonr-4756 (03)
Availability: Pub. in Electroencephalography and Clinical Neurophysiology, v24 p16-24 1968.

Descriptors: (*Conditioned reflex, *Electroencephalography), (*Behavior, Electrophysiology), Responses, Brain, Cerebral cortex, Nervous system, Physiology, Psychophysiology, Stimulation, Sleep.

The relationship between cortical recruiting responses (RRs) and arousal level was investigated using three cats trained in a classical conditioning situation. A complex schedule of 8/sec thalamic stimulation (eliciting RRs) was superimposed upon an aversive, differential discrimination paradigm to assess the effects of presentation of a novel and conditioned stimulus (CS) and differential stimulus (DS) upon RRs. ECoGs were recorded on trials unaccompanied by thalamic stimulation. RRs were depressed initially during presentation of the CS when it provoked orientation as a novel stimulus, the effect habituating with continued CS presentation. These depressive effects were reinstated by pairing the CS with shock, but only after the CS produced a conditioned response (CR). The DS initially also caused depression of RRs, even when this stimulus no longer evoked CRs. Attenuation of RRs by the DS was abolished by increasing the interval between stimulus (CS or DS) onset and subsequent recruiting stimulation from 0.7 to 1.4 sec; the CS continued to disrupt recruiting. ECoGs during non-recruiting trials appeared to be less sensitive indices of behavioral arousal than RR development and amplitude. (Author)
AD-713 312

REMOTE DETECTION OF CORTICAL SPIKE DISCHARGE: IS IT POSSIBLE. HIGH FREQUENCY VISUAL EVOKED RESPONSES: A PRODUCT OF NEURONAL SPIKING.
Final rept.,
Massachusetts General Hospital Boston
Frank R. Ervin, Joel A. Michael, and Lloyd Kaufman. 1 Jul 69, 13p
Contract DADA17-67-C-7047
Prepared in cooperation with Sperry Rand Research Center, Sudbury, Mass., Contract DA-49-193-MD-2654.
Availability: Pub. in Brain Research, Short Communications, v15 p255-258 1969.

Descriptors: (*Central nervous system, *Electrophysiology), Nerve cells, Cerebral cortex, Brain, Electroencephalography, Stimulation, Responses, Nervous system, Monitors.

Under carefully controlled conditions (in which all sources of biological noise were eliminated) it has been possible to record a high frequency visual evoked response which is accompanied by activity in a population of neurons in the visual cortex. The near identity of the frequency content of the high frequency response is a direct reflection of the spiking activity of cortical neurons. The Kaufman-Price approach to the monitoring of the electrical activity of the CNS represents a potentially valuable new technique for monitoring information flow in the nervous system (which is most probably carried by action potential pulse trains rather than low frequency activity), particularly in human investigations where it is generally not possible to place recording electrodes inside the central nervous system. (Author)
AD-713 335

PERCEPTUAL DISCRIMINATION IN MONKEYS: RETROACTIVE VISUAL MASKING,
California Univ Los Angeles Brain Research Inst
J. W. Atkins, L. G. Fehmi, and D. B. Lindsley. 1 Oct 68, 8p
Contract Nonr-4756 (02), Grant NGL-05-007-049
Availability: Pub. in Physiology and Behavior, v4 p255-259 1969.

Descriptors: (*Visual perception, Masking), (*Behavior, *Psychophysiology), Monkeys, Perception, Conditioned reflex, Training, Learning, Performance (Human), Physiology, Electrophysiology, Stimulation, Responses.
Identifiers: Retroacting visual masking, *Perceptual discrimination.

Five monkeys were trained to discriminate between a square and a triangle presented in a 5 msec tachistoscopic flash with 95-100 per cent accuracy. An essential feature of this trained performance was a programmed sequence of events in which the monkey learned to attend following self-triggering of the stimulus flash. When the monkeys had learned to make the perceptual discrimination with nearly 100 per cent accuracy, the test flash (T) presenting the patterns was followed by a nonpatterned blanking flash (B) at various interstimulus intervals (ISI). When the ISI was 40 msec or greater B had no effect on the perceptual discrimination of T and correct performance of the task remained at 95-100 per cent as in the case of T presented alone. At ISIs of 30-40 msec performance level decreased, suggesting partial masking of T by B; at ISIs of 15-25 msec performance in the visual discrimination task fell to a chance level indicating complete retroactive or backward masking of T by B. These results are in accord with human perceptual blanking or masking studies and have opened the way to investigation of the locus of visual masking by electrophysiological recording in the visual system of monkeys. (Author)
AD-713 367

BRAIN ORGANIZATION AND BEHAVIOR.
Final technical rept. 1 Mar 68-30 Jun 70,
California Univ Los Angeles Dept of Physiology
Donald B. Lindsley. 1 Oct 70, 9p
Contract N00014-69-A-0200-4024

Descriptors: (*Brain, *Psychophysiology), (*Behavior, *Nervous system), Physiology, Electrophysiology, Motivation, Perception (Psychology), Learning, Conditioned reflex, Attention, Emotions, Sleep, Cerebral cortex, Thalamus, Vision.

The report provides a summary of interdisciplinary research under the title, BRAIN ORGANIZATION AND BEHAVIOR. The goals of the project were to bring together neurophysiologists and psychologists in a combined interdisciplinary attack upon the neural mechanisms underlying behavior. Both electrophysiological and behavioral methods were employed. Problem areas fell into the following categories: Drive-Motivation, Perception, Learning, Conditioning, Attention and Emotion. The present report lists the publications and highlights of the work for the period March 1, 1968 to June 30, 1970, and summarizes the number of pre- and post-doctoral participants since the beginning of the project Sept. 1, 1955, and the total number of publications. Highlights of recent work emphasize progress in defining neural systems involved in reticulo-thalamo-cortical relationships related to sleep and wakefulness, arousal and attention, perception, learning, conditioning, and emotion. These involve a midline nonspecific thalamic projection system, two hypothalamic-hippocampal systems, a lateral nuclear group in the thalamus including the pulvinar, concerned with higher integrative functions, and specific and nonspecific visual systems. (Author)
AD-713 470 HC$3.00 MF$0.65

ALTERATION OF TASTE QUALITIES THROUGH NATURAL PRODUCTS,
Army Natick Labs Mass
Linda M. Bartoshuk. 1970, 14p*

Descriptors: (*Taste, *Psychophysiology), (*Plants (Botany), Taste), (*Sensory perception, Taste), Physiology, Food, Sensory mechanisms, Fruits.
Identifiers: *Gymnema sylvestre, *Synsepalum dulcificum, Miracle fruit.

The investigation concerns the sensory basis of palatability; specifically, the effects on the taste of foods of some rather remarkable substances derived from two plants, Gymnema sylvestre and Synsepalum dulcificum (more commonly called miracle fruit). These substances are of interest not only because of their potential use in enhancing flavor but also because they can help to elucidate the complex relationship between chemical structure and taste quality. The purpose of this paper is to present historical, chemical, and sensory information on these two plants and to suggest applications. (Author)
AD-713 510 HC$3.00 MF$0.65

THE EFFECT OF DIET ON JEJUNAL ENZYMES,
Army Medical Research and Nutrition Lab Denver Colo
Robert H. Herman, Norton S. Rosensweig, Fred B. Stifel, and Yaye F. Herman. 1970, 12p

Descriptors: (*Enzymes, Intestines), (*Diet, Enzymes), (*Gastrointestinal system, Diet), Diseases, Glycolysis, Carbohydrates, Glucose, Pathology, Diarrhea, Metabolism, Blood chemistry, Hematology, Metabolic diseases, Sucrose, Lactose.

In order to study gastrointestinal disease it is necessary to define the normal metabolic processes of the gastrointestinal mucosa. Biopsies of the jejunal mucosal epithelium were performed on normal healthy male volunteers, obese patients undergoing starvation for weight reduction, and certain patients with chronic gastrointestinal disease. Controlled diets were given to volunteers and patients and the effect of these diets on various jejunal enzyme activities was measured. The normal response of jejunal enzyme activities to dietary substances and the responses of these same enzymes in the patients were determined. The study of the effect of dietary substances on normal jejunal enzyme responses has led to the uncovering of several regulatory mechanisms for jejunal enzymes. This in turn has led to the elucidation of a number of puzzling clinical gastrointestinal conditions. The regulation of jejunal enzyme activities by dietary substances is a normal physiological process and when this process fails to occur clinical disease develops. (Author)
AD-713 538 HC$3.00 MF$0.65

THE EFFECTS OF MUSCULAR LEG EXERCISE ON NEUROENDOCRINE BLOOD LEVELS,
Army Research Inst of Environmental Medicine Natick Mass
LeeRoy G. Jones, L. H. Hartley, and J. W. Mason. 1970, 11p

Descriptors: (*Exercise, *Endocrine glands), (*Hormones, Exercise), Pituitary hormones, Levarterenol, Corticosteroid agents, Epinephrine, Blood, Muscles, Legs, Physiology, Measurement, Nervous system, Endurance, Oxygen consumption, Fatigue (Physiology), Blood pressure, Pulse rate.

Man's capacity to work has been quantitated by exercise physiologists utilizing the measurement of maximal oxygen uptake and the determination of submaximal exercise endurance time. The measurement of maximal oxygen uptake requires specially trained personnel and is not suitable for assessment of work capacity outside of the laboratory. Endurance testing requires a considerable period of time and trained personnel, and the results from such testing are highly dependent upon the motivation of the subject. A neuroendocrine profile consisting of growth hormone, norepinephrine, cortisol and epinephrine were measured during submaximal work loads of mild, moderate, and severe intensities. A comparison of the profile was made during exhaustive exercise at two different work loads (moderate and severe). (Author)
AD-713 548 HC$3.00 MF$0.65

ELECTROPHYSIOLOGICAL MEASURES OF CROSS-SENSORY INTERACTION IN THE CENTRAL NERVOUS SYSTEM,
Human Engineering Labs Aberdeen Proving Ground Md
Lynn C. Oatman. 1970, 15p

Descriptors: (*Sensory mechanisms, Interactions), (*Central nervous system, Sensory mechanisms), (*Electrophysiology, Sensory mechanisms), Psychophysiology, Physiology, Stimulation, Visual perception, Auditory perception, Interference, Attention, Nervous system, Sense organs, Sensory perception.
Identifiers: *Cross sensory interaction.

The development of modern weapons and related training devices often results in the production of man-machine systems in which the human must operate controls in response to information obtained through visual and auditory channels. The human operator is placed in many military situations where sensory interactions can occur between the visual and auditory systems, since an operator must simultaneously monitor a visual display and listen to one or more incoming messages. The known anatomical connections between the auditory and visual-sensory systems within the central nervous system would lead one to expect the occurrence of cross-sensory interactions, i.e., where the stimulation of visual sensory system would affect the perception of a stimulus presented to the auditory sensory system. The present research was conducted to provide electrophysiological evidence of cross-sensory nteractions and to investigate the physiological mechanisms responsible for the filtering process that controls sensory input to the central nervous system.
AD-713 567 HC$3.00 MF$0.65

PHYSIOLOGICAL RESPONSES OF MEN DURING SLEEP DEPRIVATION,
Civil Aeromedical Inst Oklahoma City Okla
Vincent Fiorica, E. Arnold Higgins, M. T. Lategola, Audie W. Davis, Jr., and P. F. Iampietro. May 70, 19p* FAA-AM-70-8

Descriptors: (*Sleep, Reduction), (*Fatigue (Physiology), Sleep), Psychophysiology, Physiology, Psychomotor tests, Responses, Body temperature, Temperature control, Oxygen consumption, Amines, Blood plasma, Magnesium, Urine, Excretion.
Identifiers: *Sleep deprivation, Catecholamines.

The effects of 84 hours of sleep deprivation were examined in a group of six young men and compared with a group of six controls. Subjects were studied in pairs, one sleep-deprived and one control. Primary attention was given to the responses to acute whole body cold exposure in terms of internal body and skin temperature changes, oxygen consumption changes and plasma catecholamine levels. Psychomotor performance was evaluated at 4-hour intervals over the course of the sleepless period and the patterns of urinary excretion of catecholamines, magnesium, and creatinine were followed. After the first sleepless night, psychomotor performance of sleep-deprived subjects was significantly lower than that of control subjects. The ability to regulate body temperature during standardized cold exposures, however, was not impaired by the loss of sleep. Urinary excretion patterns for the two groups were similar, except for differences related to activity level. It is suggested that, despite the gross psychomotor changes observed during sleep deprivation, physiological regulating systems are relatively unaffected by sleep loss. (Author)
AD-713 590 HC$3.00 MF$0.65

EFFECTS OF CARBON MONOXIDE ON BRAIN CELLULAR METABOLISM IN MONKEYS.
IIT Research Inst Chicago Ill
For primary bibliographic entry see Field 6T.
AD-713 609 HC$3.00 MF$0.65

EFFECTS OF THALAMOCORTICAL ACTIVATION ON RECRUITING RESPONSES. II. PERIPHERAL AND CENTRAL NEURAL STIMULATION,
California Univ Los Angeles Brain Research Inst
M. Velasco, and D. B. Lindsley. 1968, 13p
Contracts Nonr-233 (32), Nonr-4756
Sponsored in part by Grant NGL-05-007-049.
Availability: Pub. in Acta Neurologia Lationoamericano, v14 p188-199 1968.

Descriptors: (*Nervous system, *Psychophysiology), (*Central nervous system, Stimulation), (*Peripheral nervous system, Stimulation), Physiology, Brain, Cerebral cortex, Thalamus, Responses, Cats, Experimental data, Conditioned reflex, Inhibition.

In twenty unanesthetized, immobilized cats, blocking of thalamocortical recruiting responses was studied according to the way in which the phenomenon was induced. Like EEG desynchronization, blocking of recruiting occurred when arousal was induced centrally or peripherally. Auditory, visual, proprioceptive, and nociceptive activation or high frequency stimulation of telencephalic, rhinencephalic, diencephalic, rhombencephalic, and mesencephalic structures all blocked recruiting responses. Blocking of recruiting was quantitatively different depending on whether it was centrally or peripherally induced, the threshold or intensity required to induce it, and whether the stimulation was novel or repetitive. Blocking of recruiting was qualitatively similar, being generalized and affecting only the waxing and waning characteristics of the phenomenon. (Author)
AD-713 631

EFFECT OF THALAMOCORTICAL ACTIVATION ON RECRUITING RESPONSES. III. RETICULAR LESIONS,
California Univ Los Angeles Brain Research Inst
M. Velasco, and D. B. Lindsley. 1968, 12p
Contract Nonr-233 (32), Grant PHS-MH-6415
Sponsored in part by Grant NGL-05-008-049.
Availability: Pub. in Acta Neurologia Latinoamer, v14 p271-282 1968.

Descriptors: (*Brain, Stimulation), (*Nervous system, *Electrophysiology), Physiology, Cerebral cortex, Thalamus, Responses, Sense organs, Conditioned reflex, Central nervous system, Peripheral nervous system.

In twenty cats immobilized with gallamine, cortical recruiting responses and blocking of recruiting were studied comparatively before and after mesencephalic reticular lesions. Recruiting responses were elicited by repetitive (8/sec) stimulation of N. centrum medianum, N. centralis lateralis and N. centralis medialis. Blocking of recruiting was produced by means of electrical stimulation of telencephalic, rhinencephalic, diencephalic and rhombencephalic structures, as well as by activation of various sensory modalities (visual, olfactory, auditory, proprioceptive and nociceptive). Thalamocortical activation, evaluated by blocking of recruiting responses, was abolished or seriously disrupted after mesencephalic reticular lesions, regardless of whether the blocking of recruiting was previously induced centrally or peripherally. These results suggest that in an intact animal the reticular formation exerts a tonic regulatory effect on the thalamocortical mechanism responsible for the amplitude modulation of the cortical responses. (Author)
AD-713 652

THE EFFECT OF LIVE ATTENUATED VENEZUELAN EQUINE ENCEPHALOMYELITIS VIRUS VACCINE ON SERUM IRON, ZINC, AND COPPER CONCENTRATIONS IN MAN,
Army Medical Research Inst of Infectious Diseases Frederick Md
Robert S. Pekarek, George A. Burghen, Peter J. Bartelloni, Frank M. Calia, and Karen A. Bostian. 20 Oct 69, 11p
Availability: Pub. in The Jnl. of Laboratory and Clinical Medicine, St. Louis, v76 n2 p293-303 Aug 70.

Descriptors: (*Infectious diseases, *Metabolism), (*Metals, Metabolism), (*Vaccines, *Venezuelan equine encephalomyelitis virus), Blood serum, Responses, Microorganisms, Copper, Zinc, Iron, Fevers.

Serum iron and zinc concentrations fell early after exposure of volunteers to live attenuated Venezuelan equine encephalomyelitis virus vac-

cine, with a rise in serum copper concentrations. Alterations in these serum metal concentrations were significantly different from changes expected on the basis of day-to-day variability differences among individuals. The prospective nature of this study and the rapid development of altered serum metal metabolism, even in exposed subjects who remained asymptomatic, suggest that the changes in these metals in the prodromal period represent an early host response to the presence of invading microorganisms. In those subjects who developed febrile illness, the responses became exaggerated and appeared to be related in timing and magnitude to the onset and severity of the febrile reaction. These changes may have significance in providing new approaches to diagnosis and to an improved understanding of host metabolic responses during infectious illness. (Author)
AD-713 680

THE ROLE OF NONSPECIFIC RETICULO-THALAMO-CORTICAL SYSTEMS IN EMOTION,
California Univ Los Angeles Brain Research Inst
Donald B. Lindsley. 1970, 42p
Contract Nonr-4756 (00), Grant NGL-05-007-049
Sponsored in part by Grant PHS-NS-08552-01.
Availability: Pub. in Physiological Correlates of Emotion, p147-188 1970.

Descriptors: (*Nervous system, Emotions), (*Emotions, *Psychophysiology), Physiology, Brain, Cerebral cortex, Thalamus, Central nervous system, Peripheral nervous system, Electrophysiology, Conditioned reflex, Stimulation, Responses, Behavior.

Underlying emotion, which expresses itself through various cortical, visceral, and somatomotor channels, are mechanisms of arousal and activation which involve reticulo-thalamo-cortical systems. Thought, worry, and anxiety reflect emotional arousal at the cortical level; weeping, sweating, intestinal, and other visceral activities regulated by the autonomic nervous system reflect cortical, diencephalic, and brain stem arousal; facial expression, muscle tension, and tremors manifest somatomotor arousal. Mechanisms of arousal and activation are especially identified with the reticular formation of the lower brainstem. Upward extensions, including the ascending reticular activating system and its subsystems are closely related to, and interactive with, diencephalic and limbic systems which control emotional expression and emotional-motivational behavior. Recent experiments are described in which the effect of blockade of the reticulo-thalamo-cortical system is assessed in terms of electrocortical activity, both spontaneous and evoked, and behavior. Specific and nonspecific sensory systems are differentiated experimentally, and their role in perceptual discrimination, attention, and emotion are discussed. Human experiments on vigilance attention, and selective attentiveness are presented. (Author)
AD-713 687

OF COMPUTERS AND SLEEP.
Final technical rept.,
Navy Medical Neuropsychiatric Research Unit San Diego Calif
Laverne C. Johnson. 8 Oct 70, 7p
Grant Nonr (G)-00018-69
Report on Work conference held in San Diego, Calif., 2-7 Feb 70.

Descriptors: (*Sleep, *Computers), (*Electrophysiology, Sleep), Analysis, Physiology, Fourier analysis, Integral transforms, Instrumentation, Psychophysiology, Physiology, Nervous system, Electroencephalography, Symposia.
Identifiers: Rapid eye movement sleep.

The report is concerned with the use of computer to define stages of sleep from EEG data. Results from eight laboratories indicate a general overall agreement of 80-85% between computer sleep stage scoring and human scoring. The computer was unable to separate stage REM sleep from stage 1 based upon EEG data alone. Like the human scorer, the computer scoring often confused stages 3 and 4. The relative advantages of Fourier transform analysis, period analysis, the digital computer, the special purpose computer, and a specific sleep scoring instrument were discussed. (Author)
AD-713 730 HC$3.00 MF$0.65

INFLUENCE OF GANGLIONIC BLOCKADE ON CATECHOLAMINE AND METABOLITE EXCRETION,
Toronto Univ (Ontario) Dept of Pharmacology
A. Shum, G. E. Johnson, and K. V. Flattery. 20 Oct 69, 5p
Availability: Pub. in American Jnl. of Physiology, v219 n1 p58-61 Jul 70. No copies furnished.

Descriptors: (*Autonomic agents, *Metabolism), (*Amines, *Excretion), Ganglia, Inhibition, Nervous system, Levarterenol, Urine, Excretion, Nerves, Biosynthesis, Low-temperature research, Secretion, Physiology, Metabolism.
Identifiers: *Mecamylamine, *Catecholamines, Ganglionic blocking agents.

Rats were placed at 28C for a control period of 4 hr prior to treatment with mecamylamine or saline. After injection the rats were divided into two groups with one group remaining at 28C and the other being placed at 15C. Ganglionic blockade with mecamylamine decreased the urinary excretion of norepinephrine and normetanephrine in both groups of rats. 3-methoxy-4-hydroxyphenyl glycol (MHPG) excretion fell in the mecamylamine-treated group kept at 28C but rose slightly in the group transferred to 15C. The fall in norepinephrine and normetanephrine excretion, seen after mecamylamine treatment, reflects a decrease in norepinephrine secretion. The increase in MHPG in the cold indicates a rise in the synthesis and intraneuronal degradation of norepinephrine. These results support our earlier postulate that the rate of norepinephrine synthesis is dependent, at least partially, on the ambient temperature and can dissociate itself from the rate of secretion. (Author)
AD-713 738

INTERRELATIONSHIPS OF LOW ENVIRONMENTAL TEMPERATURES ON THE ACTIONS OF DRUGS,
Toronto Univ (Ontario) Dept of Pharmacology
For primary bibliographic entry see Field 6O.
AD-713 740

ELECTROPHYSIOLOGICAL CORRELATES OF VISUAL PERCEPTUAL MASKING IN MONKEYS,
California Univ Los Angeles Brain Research Inst
L. G. Fehmi, J. W. Adkins, and D. B. Lindsley. 19 Aug 68, 18p
Contract Nonr-4756 (02), Grant NGL-05-007-049
Availability: Pub. in Experimental Brain Research, v7 p299-316 1969.

Descriptors: (*Visual perception, Masking), (*Electrophysiology, Visual perception), Perception, Psychophysiology, Physiology, Optic nerve, Responses, Learning, Conditioned reflex, Behavior.

Monkeys were trained to discriminate with nearly 100% accuracy between a square and a triangle presented simultaneously in a brief tachistoscopic flash. Perceptual masking was demonstrated by inability to perform this trained visual discrimination at better than chance level when the information flash was followed in less than 20 msec by a blank second flash. In order to determine the nature and locus of this retroactive visual perceptual masking effect, electrical potentials were recorded simultaneously from three points along the optic pathways. Potentials were computer-averaged and correlated with the monkey's ability or inability to make a correct behavioral response to the information contained in the first or test flash (T). When the perception of T was masked by the second or blanking flash (B), only the evoked potential characteristic of B was observed at all recording sites, including the optic nerve or tract. This suggested that the interaction underlying masking occurred in the retina since optic nerve or tract responses are dependent upon retinal ganglion cells. When T was not masked, an early portion of evoked response to T could be detected at all recording sites. Perception of T was possible when only the initial segment of the T-potential (15 msec or less) was present at each recording site. Thus the visual information transfer essential to the performance of an already learned visual discrimination task appears to occur very early in the course of the evoked response and is not dependent upon later or secondary components. (Author)
AD-713 818

CELL MIGRATION AND PROLIFERATION DURING REPAIR OF SUPERFICIAL CORNEAL WOUNDS PRODUCED BY A CARBON DIOXIDE LASER.
Final rept. 1 Jul-31 Aug 69,
School of Aerospace Medicine Brooks AFB Tex
David J. Lehmiller. Jul 70, 47p Rept no. SAM-TR-70-29

Descriptors: (*Lasers, Hazards), (*Wounds + injuries, *Healing), (*Cornea, *Radiation injuries), (*Ophthalmology, Radiation injuries), Eye, Tissues (Biology), Cells (Biology), Histology, Biosynthesis, Desoxyribonucleic acids, Physiology, Experimental data, Tables, Rabbits, Growth.
Identifiers: *Laser burns.

Superficial wounds were produced in the rabbit corneal epithelium by a 2-mm. circular beam from a carbon dioxide laser. The healing response of the epithelium was examined histologically in tritiated thymidine radioautographs at various times following wounding. Proliferation activity and cell population per unit length were recorded in the basal cell layer proceeding outward from the wound center. Profiles of the basal cell migration, density, and proliferative pattern were graphically constructed from averaged numerical tabulations of individual wounds. The observed rates of basal cell synthesis of DNA were found to be much higher in areas where active migratory repopulation of the wound site was occurring than in undisturbed epithelium. These findings are contrary to results of other investigators who have studied healing responses in deeper corneal wounds. The difference is attributed to preservation of the epithelial basement lamina in the superficial wounds. The proliferative patterns found were characterized by one or more pronounced peaks of activity, and these were related to depressions in the basal cell population density resulting from rapid cell migration into the wound area. (Author)
AD-713 831 HC$3.00 MF$0.65

NORMAL RANGE OF BLOOD SURFACE TENSION OF MEN.
Final rept. May-Nov 69,
School of Aerospace Medicine Brooks AFB Tex
Leopoldo L. Rodriguez, and Donald A. Leeber. Sep 70, 9p Rept no. SAM-TR-70-52

Descriptors: (*Blood, Surface tension), (*Decompression sickness, Blood), Humans, Males, Periodic variations, Physiology, Hematology.

The determination of surface tension of blood from male subjects was investigated for its relationship to susceptibility to decompression sickness. The use of an anticoagulant, protamine sulfate, solved the problem of duplicate measurements (S.D. 0.5 dyne cm./l). Venous blood samples were collected from 22 men 3 times a day for 3 days a week for 2 weeks. Hematocrit determinations were also made on the last 10 subjects. The

age of each subject was recorded but, like the hematocrit, no relationship was found between age and surface tension. The day mean, based on all the subjects for 2 weeks, ranged from 56.9 to 64.9 dynes cm./1 and was not influenced by time of day. (Author)
AD-713 832 HC$3.00 MF$0.65

DETERMINING RESPIRATORY RATE AND VOLUME FROM ECG R-WAVE AMPLITUDE MODULATION.
School of Aerospace Medicine Brooks AFB Tex
For primary bibliographic entry see Field 6B.
AD-713 833 HC$3.00 MF$0.65

TISSUE CHANGES FOLLOWING VENOUS OCCLUSION USING PHOTON ABSORPTIOMETRY,
Wisconsin Univ., Madison
For primary bibliographic entry see Field 6E.
For abstract, see NSA 24 20.
COO-1422-76 HC$3.00 MF$0.65

MINERAL CONTENT AND COMPRESSIVE STRENGTH OF CANCELLOUS BONE,
Wisconsin Univ., Madison. Dept. of Radiology.
C. R. Wilson, S. Disterhoft, and J. R. Cameron. 1970, 10p
Contract AT (11-1)-1422

Descriptors: (*Bones, Compressive strength), Minerals.

For abstract, see NSA 24 20.
COO-1422-81 HC$3.00 MF$0.65

REVIEW OF BODY COMPOSITION RESEARCH AT THE UNIVERSITY OF WISCONSIN 1960-1970,
Wisconsin Univ., Madison.
John R. Cameron. Jul 70, 28p
Contract AT (11-1)-1422

Descriptors: (*Bones, Minerals), (*Minerals, In vivo analysis), (*Body composition, Minerals), Measurement.

For abstract, see NSA 24 20.
COO-1422-83 HC$3.00 MF$0.65

INFLUENCE OF IODINE INTAKE UPON KINETICS OF IODINE METABOLISM IN THE DOG.
Progress rept. 1 Nov 68-31 Oct 70.
Cornell Univ., New York. Medical Coll.
1970, 69P
Contract AT (30-1)-4048

Descriptors: (*Iodine, *Metabolism), Ingestion (Biology), Dogs, Radioactive isotopes.

For abstract, see NSA 24 20.
NYO-4048-2 HC$3.00 MF$0.65

COMPARATIVE BIOCHEMICAL STUDY OF MUSCLES.
Sravnitelno-biokhimicheskoye Izucheniye Myshts
Translation Consultants, Ltd., Arlington, Va.
I. I. Ivanov. Sep 70, 11p NASA-TT-F-13195
Contract NASW-2038
Coll- 11 P Tran- Transl. Into English From the Book 'abiogenez I Nachalnyye Stadii Evolyutsii Zhizni' Moscow, Nauka Press, 1968 P 181-187

Descriptors: *Adenosine triphosphate (atp), *Contraction, *Muscles, Biochemistry, Calcium, Ion concentration, Mammals, Muscular function.

For abstract, see STAR 08 21.
N70-38383 HC$3.00 MF$0.65

A NON-INVASIVE TECHNIQUE OF CARDIO-PULMONARY ASSESSMENT. PART 2 - ILLUSTRATIONS.
Advisory Group for Aerospace Research and Development, Paris (France).
D. M. Denison. Aug 70, 62p AGARD-AG-143-70-PT-2

Descriptors: *Blood pressure, *Cardiography, *Gas exchange, *Graphs (charts), Cardiovascular system, Hemodynamics, Human body, Pressure measurements, Pulmonary functions.

For abstract, see STAR 08 21.
N70-38530 HC$3.00 MF$0.65

MEGAKARYOCYTOPOIETIC RESPONSE TO PLATELET DEPLETION.
Rochester Univ., N.Y. School of Medicine and Dentistry.
For primary bibliographic entry see Field 6E.
For abstract, see NSA 24 20.
UR-49-1332 HC$3.00 MF$0.65

6Q. Protective Equipment

TACTICAL IMPLICATIONS OF THE PHYSIOLOGICAL STRESS IMPOSED BY CHEMICAL PROTECTIVE CLOTHING SYSTEMS,
Army Research Inst of Enviroamental Medicine Natick Mass
Ralph F. Goldman. 1970, 15p

Descriptors: (*Protective clothing, *Stress (Physiology)), Military tactics, Textiles, Heat transfer, Tolerances (Physiology), Tests.

The paper details the subsequent laboratory studies, delineates the physiological problems, describes subsequent, successful field evaluations and suggests some of the tactical limitations imposed by wearing current chemical protective systems. (Author)
AD-713 530 HC$3.00 MF$0.65

MODERN COUNTER-SURVEILLANCE IN COMBAT CLOTHING,
Army Natick Labs Mass
A. O. Ramsley. 1970, 14p

Descriptors: (*Protective clothing, *Camouflage), Colors, Reflection, Optical properties, Soils, Trees, Experimental data, Aerial photography, Sniperscopes, Infrared photography, Image intensifiers (Electronics).
Identifiers: *Countersurveillance techniques.

The paper describes the development of a colorant system for combat clothing that satisfies the reflectance requirements for camouflage protection against detection by all of the modern surveillance devices, as well as by visual observation. (Author)
AD-713 573 HC$3.00 MF$0.65

MICROCLIMATE-CONTROLLED (THERMALIBRIUM) CLOTHING SYSTEMS FOR MILITARY APPLICATIONS,
Army Natick Labs Mass
Leo A. Spano, and Vincent D. Iacono. 1970, 15p

Descriptors: (*Protective clothing, Controlled atmospheres), Reviews, Ammunition, Toxicity, Ventilation, Air conditioning equipment, Heating, Gas flow, Control, Aircraft, Tropical regions, Thermal radiation, Flight clothing.
Identifiers: *Microclimate controlled clothing.

Contents: Design principles for microclimate-controlled protective clothing systems; Protective clothing system for explosive ordnance disposal; Air-conditioned clothing for Army aircrewmen; and Performance evaluation of air-conditioned clothing.
AD-713 581 HC$3.00 MF$0.65

THE DEVELOPMENT OF RESEARCH ACTIVITIES IN THE FOOTWEAR INDUSTRY. A STUDY OF THE POTENTIAL NEEDS AND ACHIEVEMENTS OF RESEARCH, TECHNOLOGY AND OTHER INTELLECTUAL ACTIVITIES IN THE FOOTWEAR INDUSTRY.
Lowell Technological Inst. Research Foundation, Mass.
For primary bibliographic entry see Field 5C.
PB-194 870 HC$3.00 MF$0.65

6R. Radiobiology

A HISTOCHEMICAL STUDY OF LIVER ENZYMES INVOLVED IN GLYCOGEN METABOLISM IN THE X-IRRADIATED RAT.
Scientific rept.,
Armed Forces Radiobiology Research Inst Bethesda Md
G. N. Catravas, and C. G. McHale. Jun 70, 24p
Rept no. AFRRI-SR70-6

Descriptors: (*Glycogen, Metabolism), (*Rats, Whole body irradiation), (*Metabolism, Whole body irradiation), (*Enzymes, Liver), Glycoside hydrolases, Radiation effects, X rays, In vivo analysis, Glucose.
Identifiers: X ray irradiation.

The liver enzymes responsible for the breakdown and synthesis of glycogen from glucose have been investigated cytochemically in rats exposed to 1200 rads of x rays. It was found that significant changes occur in their activities and that amylophosphorylase and amylo-1,6-glucosidase, both of which are responsible for the conversion of glycogen to glucose, are markedly inhibited by radiation. A significant inhibition of the activity of 1,4 to 1,6 transglucosidase (branching enzyme) was also observed. In contrast, the activity of UDPG-glycogen transglucosylase, which is responsible for the in vivo synthesis of 1,4-polysaccharides, was found to be enhanced. (Author)
AD-713 087 HC$3.00 MF$0.65

SYNERGISM OF THYMUS AND BONE MARROW IN THE PRODUCTION OF GRAFT-VERSUS-HOST SPLENOMEGALY IN X-IRRADIATED HOSTS.
Naval Medical Research Inst Bethesda Md
For primary bibliographic entry see Field 6E.
AD-713 321

EFFECT OF REGIONAL SHIELDING AND BACTERIAL ENDOCARDITIS IN X-IRRADIATED RATS,
Armed Forces Inst of Pathology Washington D C
Benjamin Highman, Alan R. Hanks, and Norman W. Rantanen. 9 Oct 69, 7p
Availability: Pub. in Radiation Research, v43 n3 p691-697 Sep 70.

Descriptors: (*X rays, Infectious diseases), (*Cardiovascular diseases, Bacteria), (*Partial body irradiation, Resistance (Biological)), Permissible dosage, Radiological dosage, Abdomen, Hemopoietic system, Radiation injuries, Rats, Spleen, Liver, Reticulo-endothelial system.
Identifiers: *Bacterial endocarditis.

In previous studies, it was shown that bacterial endocarditis can be readily induced in rats by intravenous injection of certain strains of bacteria if their resistance has been lowered by prior x-irradiation (1) or administration of large doses of epinephrine in oil. It has also been shown that the x-ray dose tolerated by animals may be increased by regional shielding, more so by shielding the lower half than the upper half of the body. The purpose of the present study was to determine the effect of regional shielding on the susceptibility of irradiated rats to bacterial endocarditis.
AD-713 354

REDUCTION OF BIOLOGICAL EFFECTIVENESS OF X-RAYS AT VERY HIGH DOSE RATES,
Army Electronics Command Fort Monmouth N J Inst for Exploratory Research
Stanley Kronenberg, Robert Lux, and Kristian Nilson. 1970, 12p

Descriptors: (*Radiation effects, Dose rate), X rays, Radiological dosage, Radiation chemistry, Radiobiology, Dosimeters, Seeds, Germination, Free radicals.

It has been observed that relative biological effectiveness (RBE) of X-rays or gamma rays is independent of dose rate provided that their delivery time is short compared to the recuperation time of the organism. At higher dose rates, however, several effects may modify the RBE. One possible process is considered here: Biological radiation effects are dependent upon the chemical behavior of free radicals produced in the ionization process. These free radicals are usually chemically active, and can produce permanent damage by their interaction with protein chains. Suppose the concentration of these radicals is allowed to come to equilibrium by irradiating a sample at a constant dose rate for a sufficient time. For low and moderate dose rates the radical concentration is so low that direct radical-radical recombination may be neglected. At a sufficiently high dose rate however this recombination may become significant. The reduced radical concentration will reduce the RBE. (Author)
AD-713 557 HC$3.00 MF$0.65

BIOLOGICAL AND MEDICAL RESEARCH DIVISION ANNUAL REPORT, 1969.
Argonne National Lab., Ill.
Dec 69, 342p
Contract W-31-109-eng-38
See also Annual rept. 1968, ANL-7535.

Descriptors: (*Radiobiology, Research), (*Radiation effects, Research), Radioactive isotopes, Toxicity, Genetics, Biochemistry.
Identifiers: Carcinogens.

For abstract, see NSA 24 20.
ANL-7635 HC$3.00 MF$0.65

PRELIMINARY STUDIES OF THE EFFECTS OF FAST NEUTRONS ON THE OPTICAL PROPERTIES OF ANTHRACENE,
Wisconsin Univ., Madison. Dept. of Physics.
For primary bibliographic entry see Field 7E.
For abstract, see NSA 24 20.
COO-1105-159 HC$3.00 MF$0.65

THERMOLUMINESCENCE IN CaF2:nat AS A DOSIMETER FOR THE TERRESTRIAL SOLAR ULTRAVIOLET RADIATION ENVIRONMENT,
Wisconsin Univ., Madison. Dept. of Radiology.
Edwin C. McCullough, and John R. Cameron. 1968, 14p

Descriptors: (*Calcium fluorides, Thermoluminescence), (*Dosimeters, *Solar ultraviolet radiation), (*Radiation effects, Aging (Biology)), (*Ultraviolet radiation, Malignant neoplasms), Vitamin D group, Cost effectiveness.
Identifiers: *Thermoluminescent dosimetry.

For abstract, see NSA 24 20.
COO-1105-160 HC$3.00 MF$0.65

LOW TEMPERATURE THERMOLUMINESCENCE IN LiF,
Wisconsin Univ., Madison. Dept. of Physics.
For primary bibliographic entry see Field 20F.
For abstract, see NSA 24 20.
COO-1105-161 HC$3.00 MF$0.65

ANNUAL REPORT FOR PERIOD ENDING APRIL 30, 1970,
Case Western Reserve Univ., Cleveland, Ohio. School of Medicine.
Hymer L. Friedell. 8 May 70, 88p
Contract W-31-109-eng-78

Descriptors: (*Radiobiology, Research), Radiation effects, Cytology, Biochemistry, Radioactive isotopes.

For abstract, see NSA 24 20.
COO-78-220 HC$3.00 MF$0.65

TESTS OF TLD-700 HIGH SENSITIVITY LiF RIBBON FOR LOW-LEVEL ENVIRONMENTAL RADIATION MEASUREMENTS,
New York Operations Office (AEC), N.Y. Health and Safety Lab.
Arthur Shambon, and Donald C. Freeswich. Jul 70, 15p

Descriptors: (*Luminescent dosimeters, Design), (*Lithium flourides, Thermoluminescence), Gamma rays, X rays, Background radiation, Performance, Tests.
Identifiers: *Thermoluminescent dosimetry.

For abstract, see NSA 24 20.
HASL-233 HC$3.00 MF$0.65

SAFEY-RELATED OCCURRENCES IN NUCLEAR FACILITIES AS REPORTED IN 1967 AND 1968,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 18I.
For abstract, see NSA 24 20.
ORNL-NSIC-69 HC$3.00 MF$0.65

COMPILATION OF UNITED STATES NUCLEAR STANDARDS. 6TH EDITION, 1969.
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 18I.
For abstract, see NSA 24 20.
ORNL-NSIC-76 HC$3.00 MF$0.65

CALCULATED RESIDUAL RADIATION LEVELS FOR SOME ELEMENTS USED IN CYCLOTRON STRUCTURES,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 20G.
For abstract, see NSA 24 20.
ORNL-TM-2834 HC$3.00 MF$0.65

ISOTOPE PROGRAM (5000) PROGRESS REPORT FOR QUARTER ENDING JUNE 30, 1970,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 18B.
For abstract, see NSA 24 20.
ORNL-TM-3089 HC$3.00 MF$0.65

INFLUENCE OF IONIZING RADIATION ON INFECTION AND IMMUNITY,
Oak Ridge National Lab., Tenn.
P. I. Pritulin. 1970, 7p
Trans. of Veterinariya (USSR) v42 p9-11 1965.

Descriptors: (*Radiation effects, *Immunity), Infectious diseases, Ionizing radiation, Immunology, Translations, USSR.

For abstract, see NSA 24 20.
ORNL-tr-2316 HC$3.00 MF$0.65

THE SEDAN EVENT.
Reynolds Electrical and Engineering Co., Inc., Mercury, Nev. Radiological Safety Div.
For primary bibliographic entry see Field 18C.
For abstract, see NSA 24 20.
PNE-203-F HC$3.00 MF$0.65

EFFECT OF IONIZING RADIATION ON THE TESTICULAR FUNCTION OF MAN.
Progress rept.,
Pacific Northwest Research Foundation, Seattle, Wash.
Carl G. Heller. May 70, 50p
Contract AT (45-1)-1780

Descriptors: (*Testis, *Radiation effects), Germ cells, Cytology, Hormones.

For abstract, see NSA 24 20.
RLO-1780-26 HC$3.00 MF$0.65

RADIATION EFFECTS IN BIOCHEMISTRY AND ORGANIC CHEMISTRY.
Progress rept. 15 Oct 67-14 Oct 70,
Colorado Univ., Boulder.
Bert M. Tolbert. 1970, 9p
Contract AT (11-1)-690

Descriptors: (*Biochemistry, *Radiation effects), Proteins.

For abstract, see NSA 24 20.
TID-25488 HC$3.00 MF$0.65

RADIATION-INDUCED FREE RADICAL DESTRUCTION,
California Univ., Berkeley. Lawrence Radiation Lab.
For primary bibliographic entry see Field 7E.
For abstract, see NSA 24 20.
UCRL-19849 HC$3.00 MF$0.65

MORTALITY EXPERIENCE OF URANIUM AND NONURANIUM WORKERS,
Union Carbide Corp., Oak Ridge, Tenn. Y-12 Plant.
For primary bibliographic entry see Field 6J.
For abstract, see NSA 24 20.
Y-1739 HC$3.00 MF$0.65

6S. Stress Physiology

DECREASED DIURESIS IN RESPONSE TO A THIAZIDE DIURETIC AT A SIMULATED ALTITUDE.
School of Aerospace Medicine Brooks AFB Tex
For primary bibliographic entry see Field 6O.
AD-713 069 HC$3.00 MF$0.65

A MODEL DESCRIBING THE CARDIOVASCULAR RESPONSE TO THE FLACK TEST.
Technical rept.,
Texas Univ Austin Electronics Research Center
William K. Berry, P. C. Richardson, A. J. Welch, and F. B. Vogt. 22 Jul 70, 72p Rept no. TR-94
AFOSR-70-2050TR
Grant AF-AFOSR-1792-69

Descriptors: (*Cardiovascular system, Stress (Physiology)), Tests, Respiration, Lungs, Blood pressure, Models (Simulations), Responses, Pilots, Tolerances (Physiology), Acceleration.
Identifiers: *Flack test, Heart rate, Valsalva maneuver.

Qualitative Flack test information and data from an extensive literature review have been integrated into the design and interpretation of a basic Flack test model. Such a model is useful in perspectively viewing potential contributions by various physiological mechanisms to the overall cardiovascular responses; as such, it should form a foundation from which to conduct more extensive investigations. From a complex model proposed from the literature, a reduced model describing only the first eight to ten seconds of the cardiovascular response to the Flack test then was derived using simplifying assumptions justified in the literature. Records of heart rate, direct arterial blood pressure, and pulse wave velocity during Flack tests are used to quantitate the reduced ver-

sion of the Flack test model. The uses and limitations of the cardiovascular response to the Flack test as a diagnostic aid are reviewed. Some limitations of the model are noted. (Author)
AD-713 092 HC$3.00 MF$0.65

EFFECTS OF THE UNDERWATER ENVIRONMENT UPON WORK EFFICIENCY OF DIVERS.
Final technical rept. Mar-Aug 70,
Man Factors Inc San Diego Calif
Irving Streimer, D. P. W. Turner, Kent Volkmer, and D. Guerin. 1 Oct 70, 49p Rept no. MFI-70-117
Contract N00014-70-C-0189

Descriptors: (*Motor reactions, Underwater), (*Reasoning, Underwater), (*Diving, Performance (Human)), Learning curves, Memory, Respiration, Gases, Consumption, Pulse rate, Confined environments.
Identifiers: *Underwater ergonomics, Heart rate.

The effects of working underwater upon certain human performance characteristics during the execution of specific complex tasks were studied. The tasks examined were: A complex maintenance task involving the disassembly and reassembly of a water filtration unit, and The execution of a metal task involving the processes of numerical reasoning, digit memory span and pattern perception. These tasks were performed in self-paced fashion at a working depth of 33 feet. During test sessions measures were taken of breathing gas consumption rate, (Liters/min. STPD, air), as well as time and accuracy measures of the task performed. (Author)
AD-713 147 HC$3.00 MF$0.65

TACTICAL IMPLICATIONS OF THE PHYSIOLOGICAL STRESS IMPOSED BY CHEMICAL PROTECTIVE CLOTHING SYSTEMS,
Army Research Inst of Environmental Medicine Natick Mass
For primary bibliographic entry see Field 6Q.
AD-713 530 HC$3.00 MF$0.65

ANALYSIS OF THE FRANK ORTHOGONAL VECTORCARDIOGRAM DURING GRAVITATIONAL STRESS,
School of Aerospace Medicine Brooks AFB Tex
George H. Cohen, William K. Brown, Darwell E. Stowe, Edward L. Fitzpatrick, and Douglas Threatt. Nov 69, 8p Rept no. SAM-TR-70-262
Availability: Pub. in Aerospace Medicine, v41 n8 p891-896 Aug 70.

Descriptors: (*Acceleration tolerance, *Electrocardiography), Stress (Physiology), Analysis of variance, Digital computers, Data, Analysis, Analog computers, Physiology, Heart, Monitors.
Identifiers: *Vectorcardiography.

Frank orthogonal vectorcardiograms were obtained on 15 health subjects during exposure to +Gx and +Gz acceleration. Maximum vector angles of QRS and T loops were determined in the frontal, right sagittal and transverse planes on a beat-by-beat real time base, using analog-digital conversion and a specifically written logic program for the digital computer. Analysis of the data output by standard analysis of variance techniques revealed significant shifts of the maximal QRS vector angle in the transverse and right sagittal planes during +Gz acceleration which appear to be related to changes in cardiac position during acceleration stress. Frontal plane QRST angle changes were noted supporting previous observations using scalar electrocardiography during the hypergravic state. Application of analog-digital computer techniques makes representation of beat-by-beat real time ECG vectors a potentially useful tool in the study of dynamic stress environments. (Author)
AD-713 614

ELECTROMYOGRAPHIC ANALYSIS OF THE BICEPS MUSCLE FOLLOWING STANDARD AIR DIVES USING FREQUENCY ANALYSIS: A FEASIBILITY STUDY.
Progress rept.,
Naval Submarine Medical Center Groton Conn Submarine Medical Research Lab
Philip J. Whelan, and Thomas N. Markham. 24 Jul 69, 15p Rept no. SMRL-590

Descriptors: (*Electromyography, Decompression sickness), (*Decompression sickness, Diagnosis), Muscles, Electrophysiology, Analysis, Feasibility studies, Frequency analyzers, Nitrogen, Diving.

Frequency analysis of the electromyogram has been shown by clinical investigators to have some usefulness in diagnosing muscular and nerve disorders. The same methods employed following diving exposure were used to evaluate muscle frequency discharge. This was done with the idea of early diagnosis and evaluation of decompression sickness. The results of this experiment were such that no definite conclusion could be made although the feasibility of the approach could be evaluated as promising. (Author)
AD-713 622 HC$3.00 MF$0.65

SOME EFFECTS OF D-AMPHETAMINE ON CARBOHYDRATE METABOLISM AT GROUND LEVEL AND ALTITUDE.
Interim rept. Dec 69-Mar 70,
School of Aerospace Medicine Brooks AFB Tex
Patricia R. Korty. Sep 70, 10p Rept no. SAM-TR-70-62

Descriptors: (*Metabolism, *High altitude), (*Carbohydrates, Metabolism), (*Amphetamines, Metabolism), Stress (Physiology), Physiology, Drugs, Altitude, Rats, Glucose, Blood, Glycogen.

Measurement was made of blood glucose, liver glycogen, phosphorylase, and glucose-6-phosphatase in rats treated with d-amphetamine at ground level and at a simulated altitude of 8,000 ft. An increase in blood sugar levels was obtained in drug-treated animals in both environments. Altitude exposure per se also increased blood sugar levels, but the increase was not additive at altitude following drug treatment. Liver glucose-6-phosphatase activity was unaffected by drug or altitude exposure. Glycogen levels were lower in both amphetamine-treated groups, while phosphorylase activity was increased. The response of these two parameters was the same at ground level and at altitude. (Author)
AD-713 726 HC$3.00 MF$0.65

EFFECTS OF HYPERBARIC OXYGENATION ON METABOLISM. VI. EFFICACY OF PROTECTIVE AGENTS AT 5, 7, 9, AND 11 ATMOSPHERES OF 100% OXYGEN (34417),
Duke Univ Durham N C Div of Radiobiology
William D. Currie, Robert M. Gelein, Jr., and Aaron P. Sanders. 22 Jul 69, 4p
Contract N00014-67-A-0251-0002, Grant PHS-GM-14226-03
See also AD-700 535.
Availability: Pub. in Proceedings of the Society for Experimental Biology and Medicine, v133 n1 p103-105 Jan 70.

Descriptors: (*Pressure breathing, Metabolism), (*Oxygen, Toxicity), (*Chemotherapeutic agents, Pressure breathing), Glutathione, Succinates, Phosphates, Esters, Chemical compounds, Protection, Amino acids, High-pressure research, Controlled atmospheres, Rats.
Identifiers: *Hyperbaric protective agents, *Hyperbaric medicine, Butyric acid/amino, Malates, Cysteine, Glutamates.

Studies on the protective effects of various compounds against high pressure oxygen (HPO) toxicity were performed at 5, 7, 9, and 11 ATA of 100% O2. In the evaluation of protective agents it is imperative that comparisons be made at several oxygen pressures or various levels of stress since a compound may be effective as a protectant at a low stress level and be ineffective at a higher pressure. The present paper reports the relative protective ability at 5, 7, 9, and 11 ATA of a group of compounds including sulfhydryl compounds, an acid-base buffer, a neuronal inhibitor, and some substrates of oxidative phosphorylation. (Author)
AD-713 765

DECOMPRESSION SICKNESS AND MEASURED LEVELS OF EXERCISE ON SIMULATED APOLLO MISSIONS.
Interim rept. 1 Jun 69-30 Apr 70,
School of Aerospace Medicine Brooks AFB Tex
Domenic A. Maio, Thomas H. Allen, and Richard W. Bancroft. 1970, 6p Rept no. SAM-TR-70-270
Availability: Pub. in Aerospace Medicine, v41 n10 p1162-1165 Oct 70.

Descriptors: (*Decompression sickness, *Space flight), (*Exercise, Decompression sickness), Simulation, Stress (Physiology), Physiology, Space medicine, Lunar environment, Space environmental conditions, Spacecraft cabins, Environment, Pressure, Oxygen, Nitrogen.
Identifiers: Apollo.

Observations were made as to the possible influence of simulated Apollo flight and lunar surface explorations on incidence of decompression sickness. Briefly stated, the various exposures of 19 men started with 3 hours of 'shirtsleeve' exposure to O2 at 'ground level.' Next, this was rapidly changed to either 60:40::O2:N2 or 80:20::O2:N2 at 5 psia. Four hours later the next decompression was to 3.5 psia O2 for 2 hours during which there were 4 bouts of 'rowing' for 4 min interspersed with 3 intervals of mark time. The measured rate of oxygen utilization during rowing ranged from 1.2 to 1.8 liter min/1 STPD depending on lean body mass. 'Bends' did not occur after decompression from 14.5 to 5 psia. There was a lesser incidence of bends after decompression to 3.5 psia O2 from 5 psia 80:20 than from 60:40::O2:N2. There was no correlation between the grade of bends and peak levels of energy expenditure resulting from rowing at 12 strokes per min against an identical tension. (Author)
AD-713 819

NOISE WITHIN THE BELL UH-1P HELICOPTER DURING FLIGHT.
School of Aerospace Medicine Brooks AFB Tex
For primary bibliographic entry see Field 20A.
AD-713 830 HC$3.00 MF$0.65

NORMAL RANGE OF BLOOD SURFACE TENSION OF MEN.
School of Aerospace Medicine Brooks AFB Tex
For primary bibliographic entry see Field 6P.
AD-713 832 HC$3.00 MF$0.65

6T. Toxicology

EFFECTS OF CARBON MONOXIDE ON BRAIN CELLULAR METABOLISM IN MONKEYS.
Final rept. Nov 68-Jun 69,
IIT Research Inst Chicago Ill
Marilyn E. George, James P. F. Murphy, and Kenneth C. Back. Aug 70, 30p AMRL-TR-70-88
Contract F33615-68-C-1270

Descriptors: (*Carbon monoxide, Brain), (*Brain, Cells (Biology)), (*Cells (Biology), *Metabolism), (*Mitochondria, Respiration), Tissues (Biology), Hypoxia, Blood, Gases, Nitrogen, Oxygen, Toxicity, Air pollution, Industries, Hematology.

The toxicity of carbon monoxide has been extensively studied in many animal species and in man. The current interest is primarily concerned with air pollution and with establishing standards and controls for community and industrial atmospheric contamination. The effects of low level exposure

to various air pollutants, including carbon monoxide, on the general population, i.e., people of all age groups in varying states of health and disease, are receiving wide attention. A study was undertaken to determine if continuous CO exposure would cause changes in brain tissue at the cellular and subcellular level in the absence of any overt clinical signs and to establish and measure any impairment in cellular respiration and high energy production. Relatively high concentrations of CO were used initially in an attempt to induce changes with succeeding exposures to be at lower concentrations. The two exposure concentrations of CO described in this paper were 220 mg/cu M and 440 mg/cu M in the atmosphere used for spacecraft; namely, 68% oxygen, 32% nitrogen at 5 psia. (Author)
AD-713 609 HC$3.00 MF$0.65

EFFECTS OF HYPERBARIC OXYGENATION ON METABOLISM. VI. EFFICACY OF PROTECTIVE AGENTS AT 5, 7, 9, AND 11 ATMOSPHERES OF 100% OXYGEN (34417),
Duke Univ Durham N C Div of Radiobiology
For primary bibliographic entry see Field 6S.
AD-713 765

THE TOXICOLOGY OF NICKEL CARBONYL.
Progress rept.,
Connecticut Univ., Hartford. Dept. of Lab. Medicine.
F. William Sunderman, Jr. 1 Aug 70, 10p

Descriptors: (*Metal carbonyls, *Toxicity), Nickel inorganic compounds.
Identifiers: *Nickel carbonyls.

For abstract, see NSA 24 20.
NTO-4051-11 HC$3.00 MF$0.65

EFFECT OF DOSE AND DURATION OF EXPOSURE ON THE TOXICITY TO DOGS OF INTRAVENOUSLY OR ORALLY ADMINISTERED 5-FLUOROURACIL.
Final rept.,
Hazleton Labs., Inc., Falls Church, Va.
Robert P. Zendzian, and Winnie R. Teeters. 16 Oct 70, 203p 260
Contract PHS-69-2067

Descriptors: (*Fluorouracil, *Toxicology), (*Antineoplastic agents, Toxicology), Malignant neoplasms, Drugs, Dosage, Parenteral infusions, Dose rate, Central nervous system, Convulsive disorders, Toxicity, Lethal dosage, Mortality, Hematology, Blood chemical analysis, Histology, Pathology, Dogs.

5-Fluorouracil was administered to beagle dogs by intravenous infusion or orally, in divided doses, over periods of 24 to 72 hours in total doses of 12.5 to 100 mg/kg. Some dogs received a single dose and some received several doses separated by intervals of 12 to 24 days. All dogs died following a single infusion of 50 mg/kg over 24 or 48 hours. Longer infusion periods or lesser doses were not lethal. Death occurred either during dosing or within 24 hours after completion of dosing. Intravenous infusion over 48 hours appeared to be slightly more toxic than oral administration in divided doses over 48 hours. Signs of toxicity appeared to be CNS related and included clonic and tonic convulsions. Pretreatment with Dilantin or phenobarbital had no effect on the toxicity of 5-fluorouracil. Decreased numbers of platelets and leukocytes were frequently found postdose and occasional low values of hematocrit, hemoglobin and RBC count. Alkaline phosphatase and serum transaminase values were frequently elevated immediately postdose. At histopathological examination the major organs were found to be too inconsistently affected to allow cytological changes to be related to dose, duration of exposure, or mode of administration. (Author)
PB-194 852 HC$3.00 MF$0.65

ACUTE INTRAVENOUS ADMINISTRATION OF POLYVINYL-pyrrolidone 9pvp0 in rhesus monkeys.
Final rept.,
Hazleton Labs., Inc., Falls Church, Va.
Robert P. Zendzian, Winnie R. Teeters, and Robert P. Kwapien. 14 Oct 70, 30p 258
Contract PHS-69-2067

Descriptors: (*Pyrrolidines, *Toxicology), (*Antineoplastic agents, Toxicology), (*Blood plasma substitutes, Toxicity), Dosage, Malignant neoplasms, Drugs, Mortality, Signs and symptoms, Blood chemical analysis, Hematology, Pathology, Histology, Lethal dosage, Parenteral infusions.
Identifiers: *Polyvinyl pyrolidone.

Polyvinylpyrrolidone (PVP) was evaluated for acute toxic effect by intravenous administration to rhesus monkeys at doses of 5 and 10 g/kg of body weight. Death, preceded by hyperactivity, bloody mucoid discharge from mouth and nose, followed by comatose condition and reflex loss, occurred within a few minutes after administration of approximately 53% of the 10 g/kg dose. No toxic signs were observed at the 5 g/kg dose, and the animal survived until termination. Toxicity at the 5 g/kg level was indicated by elevated serum glutamicpyruvic transaminase and serum glutamic-oxaloacetic transaminase values 24 hours following compound administration. Other clinical signs observed in the surviving test animal included slight depression of total protein on Day 1; depressed platelet count, serum potassium and carbon dioxide values on Day 7; slightly depressed alkaline phosphatase value on Day 21; and slightly depressed blood glucose value on Day 28. Necropsy findings included heart with 'pointed' to and thickened walls in the control monkey; lung and thyroid hemorrhages; fluid in the lungs; pale brown kidneys; dark and light areas on the liver surface; and stomach distended with feed and water in the 10 g/kg monkey. (Author)
PB-194 853 HC$3.00 MF$0.65

COMPARATIVE TOXICITY OF A SECOND INTRAVENOUS INFUSION OF CYTOSINE ARABINOSIDE IN BEAGLE DOGS.
Final rept.,
Hazleton Labs., Inc., Falls Church, Va.
Robert P. Zendzian, and Winnie R. Teeters. 15 Oct 70, 40p 259
Contract PHS-69-2067

Descriptors: (*Cytosine, *Toxicology), (*Antineoplastic agents, Toxicology), Arabinose, Malignant neoplasms, Drugs, Parenteral infusions, Dogs, Dosage, Hematology, Toxicity, Blood chemical analysis, Dose rate.
Identifiers: *Cytosine/arabinosyl.

Six beagle dogs received infusions of Ara-C, 1 mg/kg/hr for 48 hours. Two dogs received a second infusion after seven days, and two dogs received a second infusion after 14 days. WBC count was monitored Monday through Friday and complete hematology and clinical chemistry Monday, Wednesday and Friday. Following the single dose, WBC count fell (for approximately eight days), rose to above normal (over approximately 14 days), and fell to normal value (over approximately five days). A second dose during the initial depression delayed the rise for approximately 10 days. A second dose during the rising phase caused a repetition of the pattern observed following a single dose. Under the present experimental conditions, toxicity following a second dose of Ara-C, as reflected in changes in WBC count, does not appear to differ significantly from that following the first dose. (Author)
PB-194 854 HC$3.00 MF$0.65

THE INJECTION OF NEWBORN MICE WITH SEVEN CHEMICAL ADJUVANTS TO HELP DETERMINE THEIR SAFETY IN USE IN BIOLOGICALS.
Final technical rept. 27 Apr 67-26 Apr 69,
Wisconsin Alumni Research Foundation, Madison.
Philip H. Derse. 19 Jun 69, 135p NIH-DBS-70-9
Contract PH-43-67-684

Descriptors: (*Toxicology, Chemical compounds), (*Carcinogens, Chemical compounds), Bioassay, Neoplasms, Pyridines, Phenols, Ethylene glycol, Dosage, Pathology, Mice, Mercury organic compounds, Benzoates.
Identifiers: *Ethanol/chloro, *Benzethonium chloride, *Chlorohydrins, *Thimerosal, *Phenol sulfonphthalein, *Benzoic acid/hydroxy- (methyl-ester).

Random-bred Texas-Yale mice, less than 24 hours old were injected subcutaneously with either benzethonium chloride, ethylene chlorohydrin, ethylene glycol, methylparaben, phenol red, thimerosal or pyridine. The mice were examined after 15 months for evidence of carcinogenic activity. None of the compounds appeared to have any oncogenic potential in these mice. (Author)
PB-195 153 HC$3.00 MF$0.65

TOXICOLOGY AND CARCINOGENESIS OF VARIOUS CHEMICALS USED IN THE PREPARATION OF VACCINES.
Final technical rept. 16 Feb 67-30 Apr 69,
Mason Research Inst., Worcester, Mass.
Marcus M. Mason. 8 Jun 69, 55p NIH-DBS-70-10
Contract PH-43-67-676

Descriptors: (*Vaccines, Chemical compounds), (*Toxicology, Chemical compounds), (*Carcinogens, Chemical compounds), Preparation, Neoplasms, Ethylene glycol, Phenols, Pyridines, Mercury organic compounds, Benzoates, Bioassay, Rats.
Identifiers: *Ethanol/chloro, *Benzethonium chloride, *Chlorohydrins, *Thimerosal, *Phenol sulfonphthalein, *Benzoic acid/hydroxy- (methyl-ester).

Benzethonium chloride, ethylene chlorohydrin, ethylene glycol, methylparaben, phenol red, thimerosal, and pyridine were injected in high doses subcutaneously into Fischer rats. One hundred injections were made over 50 weeks. The rats were observed for six months, after completion of the injection schedule, before necropsy. Each chemical was given to 200 rats. Benzethonium chloride produced numerous injection-site indurations. Twenty-six of these rats developed site-related fibrosarcomas. All other compounds produced 2-4 site-related tumors. There was no evidence of metastasis in any of the rats. One hundred saline-injected rats had no site-related tumors, however, the 100 uninoculated rats had one subcutaneous fibrosarcoma. (Author)
PB-195 158 HC$3.00 MF$0.65

6U. Weapon Effects

EVALUATION OF EYE HAZARDS FROM NUCLEAR DETONATIONS.
Final rept. 1 Aug 69-31 Aug 70,
Technology Inc San Antonio Tex Life Sciences Div
James A. Nickel. Sep 70, 62p
Contract F41609-69-C-0049

Descriptors: (*Retina, Burns), (*Nuclear explosions, *Flashblindness), Exposure, Thresholds (Physiology), Airburst, Explosion effects, Analysis of variance, Safety.

The retinal exposure equation, from which safe separation distances were calculated, was used as a basis for developing a linearized equation. New scaling laws for the spectral power and fireball radiance were also developed. These equations were used in deriving a variance equation for the safe separation distance. This equation is expressed in terms of variances of the independent variables: retinal exposure, time of irradiation, yield, observer and burst altitude. The importance

of retinal irradiance at the time of cutoff (as effected by blinking or introduction of other shielding) is demonstrated by an analysis of the coefficients in the variance equation, supported by a limited set of calculations. Retinal irradiance is affected by variations in the f-number of the eye and pulse profile of the fireball. The largest variances occur when the cutoff time is near a radiance maximum (approximately a thermal maximum). Small increases in the variance are realized with increased differences in the vertical separation of observer and fireball, but these appear to be of importance only with very low yield weapons. (Author)
AD-713 152 HC$3.00 MF$0.65

COMBAT CASUALTIES AND MISSION ACCOMPLISHMENT,
Army Command and General Staff Coll Fort Leavenworth Kans
For primary bibliographic entry see Field 15G.
AD-713 373 HC$3.00 MF$0.65

TEMPORARY CAVITY EFFECTS IN BLOOD VESSEL INJURY BY HIGH VELOCITY MISSILES,
Edgewood Arsenal Md
Joseph J. Amato, Norman M. Rich, Noel S. Lawson, Ronald P. Gruber, and Lawrence J. Billy. 1970, 15p

Descriptors: (*Blood vessels, *Battle injuries), Arteries, Wounds + injuries, Velocity, Damage, Ballistics, Physiology, Pathology, Tissues (Biology), Military medicine, Projectiles.

Historically, the effect of the temporary cavity upon arteries has been controversial. Angiographic and photographic documentation is presented of low velocity and high velocity injuries to arteries. The low velocity missile pushes the blood vessel ahead stretching it slightly before penetration and can be pushed aside with little or no formation of the temporary cavity. The high velocity missile neatly cuts the arterial wall at impact but then the explosive effect of the temporary cavity crushes the ends of the artery against its walls. Severity of arterial damage is proportional to the velocity of the wounding missile. The energy transferred from the high velocity missile forms the temporary cavity. Varied tissue destruction by identical missiles at equal velocity can be explained by the shape of the missile, its motion in flight, and most important the angle to the tissue at moment of impact. Knowledge of the ballistic behavior of high velocity missiles in causing arterial damage is necessary for the proper evaluation, and management of missile wounds. (Author)
AD-713 504 HC$3.00 MF$0.65

A RESEARCH CONCEPT FOR THE INTERPRETATION OF HUMAN MISSILE WOUNDS BY THE PATHOLOGIST,
Armed Forces Inst of Pathology Washington D C
Pierre A. Finck. 1970, 4p

Descriptors: (*Pathology, *Battle injuries), Bullet wounds, Wounds + injuries, Tissues (Biology), Velocity, Projectiles, Penetration, Histology, Ballistics, Military medicine.

The pathologist can make a contribution to the understanding of the wounding power of projectiles. In his study of human wounds caused by missiles, he should correlate the following data: Composition, shape, weight, and striking velocity of missile; penetrating and perforating wounds of body and organs; and radiologic, photographic, macroscopic, and microscopic aspects of wounds and their tracks. In research projects, a pathologic examination of tissue without a complete wound track and without the knowledge of the causative missile is not recommended, since it is impossible to reach significant conclusions. (Author)
AD-713 524 HC$3.00 MF$0.65

COMPARATIVE ANALYSIS OF MANDIBULAR AND MID-FACE FRACTURES IN MISSILE AND BLUNT TRAUMA: 4,015 CASES,
Letterman Army Inst of Research San Francisco Calif
Lawrence E. Tinder. 1970, 15p

Descriptors: (*Face, Fractures (Bone)), (*Fractures (Bone), *Battle injuries), Shock (Pathology), Military personnel, Military medicine, Wounds + injuries, Weapons, Bullet wounds, Ballistics.

The ratio of mandibular fractures to mid-face fractures due to blunt trauma historically has been considered to be 2 to 1; however, a rise in the incidence of mid-face fractures has been noted in recent reports on both civilian and military patients. It is conjectured that the rise in mid-face fractures in military patients is related to the high deployment of sophisticated weapons in present day combat activities. The technological advancements of these weapons have resulted in greater diversity and magnitude of trauma than previously experienced. This investigation is confined to the analysis of data on facial fractures subsequent to some of these forms of trauma. The purpose of this study was to compare the relative occurrence of mandibular, mid-face, and combination fractures of the mandible and mid-face due to various types of trauma which have afflicted members of the U.S. Army. An additional purpose of this study was to formulate a basis for comparatively evaluating facial injuries caused by diverse forms of missile and blunt trauma. (Author)
AD-713 584 HC$3.00 MF$0.65

DERIVATIONS OF THE FORMULA f=1 - e to the minus aL/A power FOR THE EXPECTED FRACTION OF CASUALTIES CAUSED BY EXPLOSIVE ORDNANCE FIRED INTO A TARGET AREA,
Rand Corp Santa Monica Calif
For primary bibliographic entry see Field 19D.
AD-713 618 HC$3.00 MF$0.65

7. CHEMISTRY

7A. Chemical Engineering

IODINE RETENTION STUDIES.
Du Pond de Nemours (E.I.) and Co., Aiken, S.C. Savannah River Lab.
For primary bibliographic entry see Field 18G.
For abstract, see NSA 24 20.
DP-1234 HC$3.00 MF$0.65

EXPERIMENTAL INVESTIGATION OF THE REMOVAL OF KRYPTON AND XENON FROM CONTAMINATED GAS STREAMS BY SELECTIVE ABSORPTION IN FLUOROCARBON SOLVENTS: PHASE I COMPLETION REPORT,
Oak Ridge Gaseous Diffusion Plant, Tenn.
For primary bibliographic entry see Field 18G.
For abstract, see NSA 24 20.
K-1780 HC$3.00 MF$0.65

MOISTURE SEPARATOR DEVELOPMENT.
MSA Research Corp., Evans City, Pa.
For primary bibliographic entry see Field 13I.
For abstract, see NSA 24 20.
MSAR-69-151 HC$3.00 MF$0.65

MOISTURE SEPARATOR DEVELOPMENT.
MSA Research Corp., Evans City, Pa.
For primary bibliographic entry see Field 13I.
For abstract, see NSA 24 20.
MSAR-69-192 HC$3.00 MF$0.65

MOISTURE SEPARATOR DEVELOPMENT.
MSA Research Corp., Evans City, Pa.
For primary bibliographic entry see Field 13I.
For abstract, see NSA 24 20.
MSAR-70-17 HC$3.00 MF$0.65

MOISTURE SEPARATOR DEVELOPMENT PROGRAM.
MSA Research Corp., Evans City, Pa.
For primary bibliographic entry see Field 13I.
For abstract, see NSA 24 20.
MSAR-70-79 HC$3.00 MF$0.65

EVALUATION OF PYRRONES AS MEMBRANES.
Franklin Inst., Philadelphia, Pa. Research Labs.
H. Scott, and F. L. Serafin. Sep 70, 36p NASA-CR-1648, REPT-14G-C2389-01
Contract NAS1-8609
Coll- 36 P Refs

Descriptors: *Membranes, *Pyrrones (trademark), *Water treatment, Flux (rate), Graphs (charts), Osmosis, Purification, Sodium chlorides, Urine.

For abstract, see STAR 08 21.
N70-38436 HC$3.00 MF$0.65

ECONOMIC COMPARISON OF SINGLE-PURPOSE AND DUAL-PURPOSE NUCLEAR PLANTS FOR SUPPLYING WIDELY SEPARATED POWER AND WATER LOADS,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 18E.
For abstract, see NSA 24 20.
ORNL-TM-2899 HC$3.00 MF$0.65

POZZOLANIC REACTIONS IN SYNTHETIC FLY ASH.
Final rept. Feb 67-Aug 70,
Iowa State Univ., Ames. Engineering Research Inst.
Elmer A. Rosauer. Aug 70, 25p ISU-ERI-AMES-84600
Grant NSF-GK-1405

Descriptors: (*Fly ash, Preparation), (*Pozzolans, Chemical reactions), (*Kaolinite, Fly ash), (*Portland pozzolan cements, Fly ash), Coal, Pyrite, Calcite, Mixtures, Particle size, Iron, Calcium, X ray diffraction analysis, Compressive properties, Glass, Lime cements.

Synthetic fly ashes of known particle size, glass content, and chemical composition were prepared from coal-associated minerals (kaolinite, pyrite, and calcite which form over 95 wt % of the mineral matter in coal) under conditions closely approximating those in suspension-fired furnaces. Thermal history of the particles was found to play a pre-eminent role in determining pozzolanic reactivity. Although particles cooled at a slow rate contain less glass than those quenched at a rapid rate, the difference in glass content is not sufficient to explain the large reduction in pozzolanic reactivity, which may instead relate to reduction in residual strain by annealing. X-ray, light microscopic, and chemical analyses showed that pyrite added to kaolinite for production of synthetic fly ash gives rise to hematite and magnetite, whereas calcite gives rise to calcium hydroxide and calcium carbonate. Pyrite and calcite also influence the glass composition to some extent. Of secondary importance, in regard to pozzolanic strength and activity, is fineness of the fly ash particles. Provided the glass is highly strained or vitrified, the finer particles are more reactive. The chemical composition of the ash was found to be of less significance. (Author)
PB-194 906 HC$3.00 MF$0.65

CONVERSION OF MUNICIPAL AND INDUSTRIAL REFUSE INTO USEFUL MATERIALS BY PYROLYSIS.
Bureau of Mines, Washington, D.C.
For primary bibliographic entry see Field 13B.
PB-194 946 HC$3.00 MF$0.65

RECOVERY OF METALS FROM ELECTROPLATING WASTES BY THE WASTE-PLUS-WASTE METHOD.
Technical progress rept. no. 27,

Bureau of Mines, Washington, D.C.
L. C. George, and Andrew A. Cochran. Aug 70, 13p*
Report on Solid Waste Research Program.

Descriptors: (*Electroplating, *Materials recovery), (*Industrial wastes, Electroplating), (*Water pollution, *Metals), Silver, Cobalt, Copper, Chromium, Iron, Nickel, Nitrates, Industrial waste treatment, Cyanides, pH, Precipitation (Chemistry), Acidification.
Identifiers: *Water pollution control, Benzene sulfonic acid/nitro- (sodium-salt).

Addition of an acid waste to an alkaline cyanide waste was investigated for five different combinations of electroplating wastes. At the optimum final pH values of the mixtures, metals and cyanides were almost quantitatively precipitated. No evolution of hydrogen cyanide was detected. By a few additional processing steps, significant amounts of valuable metals were recovered for recycling. The waste-plus-waste step is attractive because no reagents are required, metals are concentrated, and a relatively harmless effluent that meets most water quality standards for cyanide content is produced. (Author)
PB-194 948 HC$3.00 MF$0.65

TREATMENT OF ACID MINE DRAINAGE BY REVERSE OSMOSIS.
Rex Chainbelt, Inc., Milwaukee, Wis.
For primary bibliographic entry see Field 13H.
PB-195 200 MF$0.65

TECHNETIUM AS A CATALYST IN ORGANIC REACTIONS.
Brigham Young Univ., Provo, Utah.
For primary bibliographic entry see Field 7C.
For abstract, see NSA 24 20.
RLO-2017-2 HC$3.00 MF$0.65

7B. Inorganic Chemistry

HIGH-PRESSURE, HIGH-TEMPERATURE SYNTHESES OF SELECTED LANTHANIDE-TELLURIUM COMPOUNDS,
Brigham Young Univ Provo Utah Dept of Chemistry
J. F. Cannon, and H. T. Hall. 23 Jun 69, 8p AROD-6811:4-C
Grant DA-ARO (D)-31-124-70-G10
Availability: Pub. in Inorganic Chemistry, v9 n7 p1639-1643 1970.

Descriptors: (*Tellurides, Synthesis (Chemistry)), (*Rare earth compounds, Synthesis (Chemistry)), High-pressure research, High-temperature research, Phase studies, Crystal lattices.

Tetragonal LTe (2-x) (0< or = to x < or = to 0.3) compounds were synthesized for the following lanthanides with lattice parameters (a (o)), C (o) and standard deviations were determined as indicated (values in A): Y, 4.291 (3), 8.912 (6), Ho, 4.264 (2), 8.872 (4); Er, 4.248 (2), 8.865 (5); Tm, 4.240 (2), 8.831 (4); Lu, 4.222 (1), 8.807 (3). Orthorhombic LuTe3 with lattice parameters (a (o)), b (o), C (o) 4.277 (1), 25.137 (6), 4.278 (1) A was also synthesized. Pressures to 100 kbars with temperatures to 1200C were employed in the studies, and the P-T regions required for synthesis were delineated. The new compounds are extensions of the LTe (2-x) and LTe3 series previously reported through Dy for LTe (2-x) and through Tm for LTe3. (Author)
AD-713 232

FAR-INFRARED AND RAMAN SPECTRA OF PHOSPHONIUM CHLORIDE AND PHOSPHONIUM CHLORIDE-d4,
South Carolina Univ Columbia Dept of Chemistry
J. R. Durig, D. J. Antion, and C. B. Pate. 28 Nov 69, 11p AROD-6837:13-C
Grants DA-ARO (D)-31-124-G864, NSF-GP-8429
Availability: Pub. in Jnl. of Chemical Physics, v52 n11 p5542-5548, 1 Jun 70.

Descriptors: (*Phosphonium compounds, *Spectra (Infrared)), (*Raman spectroscopy, Phosphonium compounds), X-ray diffraction analysis, Deuterated compounds, Chlorides, Phosphines.

The far-infrared spectra of thin films of PH4Cl and PD3Cl have been recorded at -170C. Raman spectra of polycrystalline samples of both compounds were also recorded at -170C. One libration and three translations were observed as well as eight internal modes. Several combinations and overtones were assigned and the zone-edge wavenumber of a second libration has been inferred. The barrier restricting reorientation of the PH4 and PD4 ions has been calculated from the observed librational wavenumbers to be 8.5 kcal/mole and forces contributing to the barrier are discussed. The lattice dimensions of PH4Cl were determined to be a = b = 5.82A and c = 4.22A from the x-ray diffraction pattern of a polycrystalline sample. (Author)
AD-713 248

1,1'-METHYLENETITANOCENE DICHLORIDE,
Columbia Univ New York Dept of Chemistry
Thomas J. Katz, and Nancy Acton. 13 Apr 70, 6p AROD-7908:1-C
Grant DA-ARO (D)-31-124-G1119
Availability: Pub. in Tetrahedron Letters, n28 p2497-2499 1970.

Descriptors: (*Complex compounds, *Titanium compounds), (*Ethylenes, *Polymerization), Chlorides, Dienes, Nitrogen, Ammonia, Catalysts.
Identifiers: *Titanium/dichloro- (methylene-bis (cyclopentadienyl)), Cyclopentadiene compounds, *Nitrogen fixation.

It is reported that a hydrocarbon dianion such as biscyclopentadienylmethane dianion, made up of two linked cyclopentadienyl anions, reacts with titanium tetrachloride to give monomeric bridged titanocene dichloride, and that this material with lithium naphthalenide in tetrahydrofuran fixes nitrogen and with diethylaluminum chloride polymerizes ethylene. (Author)
AD-713 259

ELECTRONIC AND VIBRATIONAL SPECTROSCOPY IN A NEMATIC LIQUID CRYSTAL SOLVENT. BAND POLARIZATIONS FOR BINUCLEAR METAL CARBONYLS,
California Inst of Tech Pasadena
For primary bibliographic entry see Field 7D.
AD-713 279

SOLVENT EXTRACTION OF VOLTILE DIVALENT METAL FLUORO-BETA-DIKETONATES,
Monsanto Research Corp Dayton Ohio Dayton Lab
For primary bibliographic entry see Field 7D.
AD-713 322

STRUCTURE AND LATTICE DYNAMICS OF METAL AZIDES AND THEIR RELATIONSHIP TO STABILITY,
Picatinny Arsenal Dover N J Feltman Research Labs
For primary bibliographic entry see Field 20B.
AD-713 585 HC$3.00 MF$0.65

REACTIONS OF THE SESQUIOXIDES OF Pm, Nd, AND Sm WITH WATER,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
For primary bibliographic entry see Field 7E.
For abstract, see NSA 24 20.
BNWL-1421 HC$3.00 MF$0.65

SODIUM-AIR REACTION AS A REACTOR FAULT CONDITION,
Division of Technical Information Extension (AEC), Oak Ridge, Tenn.
K. Keller. Jan 70, 47p
Trans. of Kernforschungszentrum, Karlsruhe. Report (West Germany) KFK-1034.

Descriptors: (*Liquid metal cooled reactors, *Nuclear reactor accidents), (*Liquid metal coolants, *Oxidation), Air, Sodium, West Germany.
Identifiers: Liquid sodium.

For abstract, see NSA 24 20.
EURFNR-754 HC$3.00 MF$0.65

STUDIES IN ELECTROCHEMISTRY,
Joint Publications Research Service, Washington, D.C.
For primary bibliographic entry see Field 7D.
JPRS-51604 HC$3.00 MF$0.65

OXYGEN COMPLEXES FORMED AT 4 K.
Massachusetts Inst. of Tech., Cambridge. Dept. of Chemical Engineering.
R. C. Reid, and F. Wong. Jun 70, 37p NASA-CR-112785, REPT-2
Contract NGR-22-009-312

Descriptors: *Molecular structure, *Oxygen, *Storage stability, Combustion chambers, Cryogenics, High temperature.

For abstract, see STAR 08 21.
N70-37610 HC$3.00 MF$0.65

SILICON CONTAINING CARBONIC ACIDS AND DERIVATIVE COLORS AND SYNTHETIC FIBERS.
Siliciumhaltige Carbonsaeuren Und Davon Abgeleitete Farbstoffe Und Kunststoffe
Eidgenossische Technische Hochschule, Zurich (Switzerland).
P. Gallegra. 1969, 145p DISS-NR-4286
Lang- in German

Descriptors: *Carbonic acid, *Dyes, *Polymers, *Silicon, Chemical reactions, Organic compounds, Polyurethane resins.

For abstract, see STAR 08 21.
N70-37783 HC$3.00 MF$0.65

THERMAL DECOMPOSITION AND EXPLOSION OF AMMONIUM PERCHLORATE AND AMMONIUM PERCHLORATE PROPELLANT UP TO FIFTY KILOBARS.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
H. R. Voelkl. Sep 70, 23p NASA-TN-D-6013, E-4568
Contract 129-03

Descriptors: *Ammonium perchlorates, *Explosions, *High pressure, *Pyrolysis, *Solid rocket propellants, Activation energy, Anvils, Electrical resistance.

For abstract, see STAR 08 21.
N70-38503 HC$3.00 MF$0.65

CONTRIBUTION TO THE CHEMISTRY OF NIOBIUM (IV).
Beitrag Zur Chemie des Niob/Iv/
Eidgenossische Technische Hochschule, Zurich (Switzerland).
W. Perron. 1969, 83p DISS-4370
Lang- in German

Descriptors: *Chlorides, *Niobium compounds, *Reduction (chemistry), Chemical composition, Chemical reactions.

For abstract, see STAR 08 21.
N70-38953 HC$3.00 MF$0.65

THERMAL CONDUCTIVITIES OF Tm_2O_3, Yb_2O_3, AND A Tm_2O_3-Yb_2O_3 MIXTURE,
Oak Ridge National Lab., Tenn.

For primary bibliographic entry see Field 18B.
For abstract, see NSA 24 20.
ORNL-TM-3066 HC$3.00 MF$0.65

BEHAVIOR OF TRIVALENT ACTINIDES AND LANTHANIDE ELEMENTS IN CHLORIDE SOLUTION,
Oak Ridge National Lab., Tenn.
Bernard Marin. 1970, 108p
Trans. from Paris Univ. Faculte des Sciences. Doctoral thesis (France) CEA-R-3803 1969.

Descriptors: (*Rare earth compounds, *Complex compounds), (*Actinide series compounds, Complex compounds), Chlorides, Solutions, Theses, France, Translations.

For abstract, see NSA 24 20.
ORNL-tr-2342 HC$3.00 MF$0.65

CONTRIBUTIONS TO THE DATA ON THEORETICAL METALLURGY. XIII. HIGH-TEMPERATURE HEAT-CONTENT, HEAT-CAPACITY, AND ENTROPY DATA FOR THE ELEMENTS AND INORGANIC COMPOUNDS,
Bureau of Mines, Washington, D.C.
For primary bibliographic entry see Field 7D.
PB-195 019 MF$0.65

REDUCTION OF PLUTONIUM HEXAFLUORIDE TO PLUTONIUM TETRAFLUORIDE BY THERMAL DECOMPOSITION,
Dow Chemical Co., Golden, Colo. Rocky Flats Div.
For primary bibliographic entry see Field 7E.
For abstract, see NSA 24 20.
REP-1357 HC$3.00 MF$0.65

RARE METALS.
Revised ed (3rd),
National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.
O. A. Songina. 1970, 451p* SFCSI-Int (TT-70-50021)
Trans. of mono. Redkie Metally, Moscow, 1964 565p, by J. Schmorak.

Descriptors: (*Metals, Chemical properties), (*Refractory metals, Chemical properties), (*Rare earth elements, Chemical properties), (*Transition metals, Chemical properties), Handbooks, Inorganic compounds, Rhenium, Molybdenum, Tungsten, Vanadium, Niobium, Tantalum, Zirconium, Hafnium, Germanium, Scandium, Yttrium, Uranium, Gallium, Indium, Actinide series, Transuranium elements, Thallium, Beryllium, Lithium, Rubidium, Cesium, Selenium, Tellurium, Electrochemistry, Metalliferous minerals, Chemical analysis, USSR, Translations.

The book contains general information on rare metals, their compounds, their occurrence in nature, and their preparation and uses. An especially detailed treatment is given of the chemistry of rare elements, including the chemical properties and the principles of analytical determination of these elements and their compounds. (Author)
TT-70-50021 HC$3.00 MF$0.65

HIGH-PRESSURE RAMAN SPECTRA OF HEXAGONAL ZINC SULFIDE,
California Univ., Los Angeles. Dept. of Chemistry.
For primary bibliographic entry see Field 7D.
For abstract, see NSA 24 20.
UCLA-34-P-88-28 (Rev.) HC$3.00 MF$0.65

MINUTES, SPECIALISTS MEETING ON SODIUM-WATER REACTIONS HELD UNDER THE AUSPICES OF THE INTERNATIONAL ATOMIC ENERGY AT ARGONNE NATIONAL LABORATORY, NOVEMBER 5-6, 1968,
Argonne National Lab., Ill.
For primary bibliographic entry see Field 18J.
For abstract, see NSA 24 20.
UNC-SPLM-1059 HC$3.00 MF$0.65

7C. Organic Chemistry

INTRAMOLECULAR PROTON TRANSFER IN THE EXCITED SINGLET STATE OF 3-HYDROXY-2-NAPHTHOIC ACID.
Minnesota Univ Minneapolis Dept of Chemistry
For primary bibliographic entry see Field 7D.
AD-713 164 HC$3.00 MF$0.65

NANOSECOND TIME-RESOLVED EMISSION SPECTROSCOPY: SPECTRAL SHIFTS DUE TO SOLVENT-EXCITED SOLUTE RELAXATION.
Minnesota Univ Minneapolis Dept of Chemistry
For primary bibliographic entry see Field 7D.
AD-713 177 HC$3.00 MF$0.65

NANOSECOND TIME RESOLVED EMISSION SPECTROSCOPY OF 1-ANILINO-8-NAPHTHALENE SULFONATE.
Minnesota Univ Minneapolis Dept of Chemistry
For primary bibliographic entry see Field 7D.
AD-713 178 HC$3.00 MF$0.65

HYDROGEN SCRAMBLING IN ORGANIC IONS AS A FUNCTION OF INTERNAL ENERGY. EXTENSION OF THE ENERGY RANGE,
Cornell Univ Ithaca N Y Dept of Chemistry
I. Howe, and F. W. McLafferty. 30 Mar 70, 6p AROD-8246:4-C
Grant DA-ARO (D)-31-124-G1117
Availability: Pub. in The Jnl. of the American Chemical Society, v92 n12 p3797-3799, 17 Jun 70.

Descriptors: (*Mass spectroscopy, *Exchange reactions), Hydrogen, Deuterated compounds, Labeled substances, Decomposition.

The paper reports that secondary decompositions can provide information on molecular ions formed with a variety of internal energies including energies substantially higher than those observed with collision-induced metastables. (Author)
AD-713 230

BETA-KETO SULFOXIDES. IX. CONVERSION INTO ACETYLENIC SULFOXIDES AND SULFONES,
Iowa State Univ Ames
Glen A. Russell, and L. A. Ochrymowycz. 1 Dec 69, 7p AROD-4315:14-C
Grant DA-ARO (D)-31-124-G867
See also AD-701 518.
Availability: Pub. in Jnl. of Organic Chemistry, v35 n6 p2106-2108 1970.

Descriptors: (*Sulfoxides, Chemical reactions), (*Alkenes, *Reduction (Chemistry)), Alkynes, Organic sulfur compounds.
Identifiers: *Organic sulfides, *Sulfones.

A method for converting a vinyl sulfide into an acetylenic sulfide is described. (Author)
AD-713 254

1,1'-METHYLENETITANOCENE DICHLORIDE,
Columbia Univ New York Dept of Chemistry
For primary bibliographic entry see Field 7B.
AD-713 259

NATURE OF SOLVENT EFFECTS ON THE PROTON CHEMICAL SHIFTS OF NONPOLAR SOLUTES,
Stevens Inst of Tech Hoboken N J Dept of Chemistry and Chemical Engineering
For primary bibliographic entry see Field 7D.
AD-713 261

APPLICATION OF ELECTRON SPIN RESONANCE SPECTROSCOPY TO STUDIES OF VALENCE ISOMERIZATION. II. BICYCLO (4.1.0)HEPTENE-2, 5-SEMIDIONES,
Iowa State Univ Ames
Glen A. Russell, Thomas Ku, and Jerrold Lokensgard. 20 Jan 70, 6p AROD-4315:17-C
Grant DA-ARO-D-31-124-G867
Availability: Pub. in Jnl. of the American Chemical Society, v92 n12 p3833-3884, 17 Jun 70.

Descriptors: (*Ketones, *Electron spin resonance), Alkenes, Ions, Free radicals, Polycyclic compounds, Molecular structure.
Identifiers: Norcarene dione, Diketones.

The synthesis, structure and properties of semidiones are discussed. (Author)
AD-713 296

NEW INERT FREE RADICAL SPECIES EMERGE,
Consejo Superior de Investigaciones Cientificas Barcelona (Spain) Departamento de Quimica Organica
Manuel Ballester. 1970, 2p ARL-70-0193W
Contract F61052-67-C-0065
Availability: Pub. in European Chemical News, Technical Week, p34, 23 Jan 70.

Descriptors: (*Free radicals, Stability), (*Halogenated hydrocarbons, Free radicals), Chlorine compounds, Electron spin resonance, Amines, Spain.
Identifiers: Methane/tris (pentachlorophenyl), *Chlorine aromatic compounds.

The preparation and applications of the perchlorodiphenylmethyl radical is reviewed.
AD-713 317

BILDNING AV ILLALUKTANDE AMNEN VID SULFATKOK (Formation of Malodorous Compounds in the Sulphate Process),
Svenska Traforskningsinstitutet Stockholm
For primary bibliographic entry see Field 11L.
AD-713 349

CHEMICAL DEGRADATION OF WOOD: THE RELATIONSHIP BETWEEN STRENGTH RETENTION AND PENTOSAN CONTENT.
Yale Univ New Haven Conn School of Forestry
For primary bibliographic entry see Field 11L.
AD-713 409

SYNTHETIC LUBRICANT,
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 11H.
AD-713 448 HC$3.00 MF$0.65

COPOLYMERIZATION OF ESTERS OF BIS (ALLYLOXYMETHYL) PHOSPHINIC ACID WITH METHYLMETHACRYLATE,
Foreign Technology Div Wright-Patterson AFB Ohio
L. A. Eliseeva, I. M. Shermergorn, B. Ya. Teitelbaum, and T. A. Yagfarova. 27 Aug 70, 6p
Rept no. FTD-HT-23-482-70
Edited trans. of Vysokomolekulyarnye Soedineniya. Seriya B (USSR) v11 n2 p104-106 1969, by D. Koolbeck.

Descriptors: (*Organic phosphorus compounds, *Polymerization), (*Acrylic resins, *Copolymerization), Crosslinking (Chemistry), Fire resistant materials, Thermal properties, Mechanical properties, USSR.
Identifiers: *Phosphinites, *Acrylate copolymers, *Phosphinic acid/bis (allyloxymethyl), Swelling, Polymethyl methacrylate, Translations.

A study has been made of the polymerization of bis (allyloxmethyl) phosphinates of a given general

formula and copolymerization of these phosphinates with methylmethacrylate (MMA). The study was undertaken because polymers of this type exhibit valuable properties such as enhanced fire resistance or good adhesion to metals. The esters alone did not polymerize, but yielded copolymers with MMA in MMA/phosphorus-containing monomer ratios of 96/4 to 84/16. The copolymers were solid transparent blocks insoluble in the usual solvents of poly (methylmethacrylate). The thermomechanical curves are characteristic of cross-linked systems. Starting mixtures containing over 20 percent organophosphorus monomers yielded rubber-like products. The swelling curves of the polymers in dichloroethane indicated that swelling is accompanied by weight losses as a result of the extraction of low-molecular-weight products from the swollen polymer. (Author)
AD-713 459 HC$3.00 MF$0.65

SENSITIVITY FUNDAMENTALS.
Stanford Research Inst Menlo Park Calif
For primary bibliographic entry see Field 7D.
AD-713 474 HC$3.00 MF$0.65

A NEW SENSITIVE METHOD FOR THE DETECTION AND QUANTITATIVE ANALYSIS OF AMMONIA AND ALIPHATIC AMINES,
Edgewood Arsenal Md
David N. Kramer, and John M. Sech. 1969, 12p*

Descriptors: (*Amines, *Chemical analysis), (*Ammonia, Chemical analysis), (*Quinones, Chemical analysis), Quantitative analysis, Amides, Sulfonic acids.
Identifiers: *Benzene sulfonamide/N-benzoquinonyl, *Sulfonamides, *Spectroscopic analysis, Benzene sulfonamide/N-N'- (imino-bis (dihydroxyphenyl))-di, Chemical reaction mechanisms.

A direct, one-step method is given for the determination of ammonia (and aliphatic amines). The rate of the reaction is so rapid that instantaneous determinations may be made of the ammonia concentrations being sampled. The method requires collection of ammonia in a suitable neutral solvent (e.g., dioxane) containing the reagent, o-(benzenesulfonamido)-p-benzoquinone, and measuring the absorption of light at 480 millimicrons. A proposed reaction sequence is given. (Author)
AD-713 556 HC$3.00 MF$0.65

CHEMILUMINESCENT ORGANIC PHOSPHIDES,
Frankford Arsenal Philadelphia Pa Pitman-Dunn Research Labs
Gilbert P. Sollott, Jonathan L. Snead, and Richard A. Strecker. 1969, 11p

Descriptors: (*Organic phosphorus compounds, *Chemiluminescence), Molecular structure, Emissivity, Lithium compounds, Oxidation, Molecular orbitals, Fluorescence.
Identifiers: *Phosphine/dicyclohexyl-lithio, *Phosphinic acid/dicyclohexyl- (lithium-salt), Emission spectra.

Work was undertaken to determine the variability of the emission characteristics of organic phosphides with change in molecular structure; to identify the emitting species responsible for the observed chemiluminescence; and to gain some insight into the mechanism of the chemiluminescent oxidation. (Author)
AD-713 580 HC$3.00 MF$0.65

THE REACTION OF HEXAFLUOROBENZENE WITH SODIUM AZIDE.
Memorandum rept.,
Ballistic Research Labs Aberdeen Proving Ground Md
Joseph G. Morse, and Lester P. Kuhn. Aug 70, 20p
Rept no. BRL-MR-2059

Descriptors: (*Azides, Synthesis (Chemistry)), Halogenated hydrocarbons, Fluorine compounds, Benzenes, Spectra (Infrared), Spectra (Visible + ultraviolet), Differential thermal analysis, Sodium compounds.
Identifiers: *Benzene/hexafluoro, *Fluorine aromatic compounds, Sodium azide, Benzene/diazido-tetrafluoro, Benzene/difluoro-tetraazido.

Sodium azide was found to react with hexafluorobenzene in dimethylsulfoxide solution to yield two major products and one minor product. On the basis of infrared, ultraviolet and nmr spectra, elemental analysis, molecular weight, and catalytic hydrogenation, the major products are believed to be diazido tetra-fluorobenzene, and tetraazidodifluorobenzene. The minor product is believed to be hexaazidobenzene. (Author)
AD-713 665 HC$3.00 MF$0.65

INFRARED SPECTRA OF AMINO ACIDS AND SIMPLE POLYPEPTIDES.
Technical rept. 1 Jan 69-31 Mar 70,
Monsanto Research Corp Dayton Ohio Dayton Lab
William R. Feairheller, Jr., and J. T. Miller, Jr. Aug 70, 76p* AFML-TR-70-147
Contracts F33615-67-C-1363, F33615-70-C-1239

Descriptors: (*Peptides, *Spectra (Infrared)), (*Amino acids, Spectra (Infrared)), (*Glycines, Spectra (Infrared)), Molecular energy levels, Vibration, Cryogenics.
Identifiers: *Alanines, *Leucine, Matrix isolation techniques.

The infrared spectra of a number of amino acids and simple polypeptides have been studied over teh 4000-33/cm region at room temperature and at liquid nitrogen temperature. It was found that recording spectra at low temperature increases the band definition and sharpness for those compounds that exist in the zwitterion form. The spectra of the hydrochlorides of amino acid, which in general are well defined at room temperature, are not greatly improved in going to liquid nitrogen temperature. For materials in the zwitterion form, this observed improvement definitely aids in the identification of the compounds. Glycine, alanine, and leucine were studied in some detail. Sizable frequency shifts are noted in the absorption bands of vibrations assigned to torsions and skeletal deformations as the sample is cooled to lower temperatures. If this is found to be a general occurrence in other classes of compounds, this frequency shift may be useful for identifying the torsion and skeletal deformation bands for assignments of vibrational frequencies. (Author)
AD-713 689 HC$3.00 MF$0.65

PHENYLATION OF AZOBENZENE,
Defence Standards Labs Maribyrnong (Australia)
J. Miller, D. B. Paul, L. Y. Wong, and A. G. Kelso. 24 Apr 69, 5p
Prepared in cooperation with Malaya Univ., Kuala Lumpur, Malaysia, Dept. of Chemistry.
Availability: Pub. in Jnl. of the Chemical Society, Sect-B. Physical Organic Chemistry, p62-65 1970. No copies furnished.

Descriptors: (*Benzenes, Chemical reactions), Free radicals, Organic nitrogen compounds.
Identifiers: *Azobenzenes, Hammett constants.

The substituent effect of the phenylazo-group in homolytic phenylation has been measured with azobenzene as substrate and nitrobenzene as reference compound. Even after allowance for the large number of sites of substitution the phenylazo-group was shown to equal the nitro-group in its activating power. Isomer ratios and partial rate factors have been determined and are discussed. (Author)
AD-713 739

PHYSICAL PROPERTIES OF THE CHOLESTERIC MESOPHASE.
Kent State Univ., Ohio. Liquid Crystal Inst.
For primary bibliographic entry see Field 7D.
AD-822 208 HC$3.00 MF$0.65

HARTREE-FOCK WAVE FUNCTIONS AND COMPUTED ONE-ELECTRON PROPERTIES FOR OXYGEN MONOFLUORIDE (OF, doublet Pi) AT SIX INTERNUCLEAR SEPARATIONS,
Argonne National Lab., Ill.
For primary bibliographic entry see Field 7D.
For abstract, see NSA 24 20.
ANL-7702 HC$3.00 MF$0.65

STUDIES IN ELECTROCHEMISTRY,
Joint Publications Research Service, Washington, D.C.
For primary bibliographic entry see Field 7D.
JPRS-51604 HC$3.00 MF$0.65

VIBRATIONAL ANISOTROPY AND GOL'DANSKII-KARYAGIN EFFECT IN TRIMETHYLTIN CYANIDE,
Rutgers - The State Univ., New Brunswick, N.J. School of Chemistry.
For primary bibliographic entry see Field 7D.
For abstract, see NSA 24 20.
NYO-2472-68 HC$3.00 MF$0.65

RAPID LINEAR PYROLYSIS OF COMPOSITE SOLID PROPELLANT INGREDIENTS.
Vitro Labs., Silver Spring, Md.
D. R. Simon. Sep 70, 29p NASA-CR-66856
Contract NAS1-8450

Descriptors: *Polymethyl methacrylate, *Pyrolysis, Composite propellants, Heat flux, Propellant combustion, Solid rocket propellants.

For abstract, see STAR 08 21.
N70-37786 HC$3.00 MF$0.65

PREPARATION OF FLUOROELASTOMERS FOR USE WITH CRYOGENIC STORABLE PROPELLANTS FINAL REPORT, 1 FEB. 1968 - 31 JAN. 1969.
Peninsular Chemresearch, Inc., Gainesville, Fla.
S. E. Rochow, and E. C. Stump. Jan 69, 42p
NASA-CR-112965
Contract NAS7-668

Descriptors: *Cryogenic fluid storage, *Elastomers, *Fluoro compounds, *Polymerization, Liquid rocket propellants.

For abstract, see STAR 08 21.
N70-38192 HC$3.00 MF$0.65

THERMODYNAMIC AND KINETIC STUDIES ON MIXED COMPOUNDS OF RARE EARTHS.
Eidgenossische Technische Hochschule, Zurich (Switzerland).
For primary bibliographic entry see Field 7D.
For abstract, see STAR 08 21.
N70-38311 HC$3.00 MF$0.65

CHEMICAL BONDING AND NEPHELAUXETIC EFFECT IN TRANSITION METAL COMPLEXES. DISCUSSION OF OPTICAL SPECTRA AND E R S-DATA OF COPPER II COMPLEXES IN SINGLE CRYSTALS.
Eidgenossische Technische Hochschule, Zurich (Switzerland).
For primary bibliographic entry see Field 7D.
For abstract, see STAR 08 21.
N70-38954 HC$3.00 MF$0.65

X-RAY DIFFRACTION DATA ON LIQUID TRIMETHYLAMINE DECAHYDRATE AT 5C,
Oak Ridge National Lab., Tenn.

For primary bibliographic entry see Field 7D.
For abstract, see NSA 24 20.
ORNL-4571 HC$3.00 MF$0.65

TECHNETIUM AS A CATALYST IN ORGANIC REACTIONS.
Progress rept.
Brigham Young Univ., Provo, Utah.
28 Apr 70, 4p
Contract AT (45-1)-2017

Descriptors: (*Technetium, *Catalysts), (*Chemical hydroforming, Catalysts), Cyclization, Cyclohexane, Methane, Benzene.

For abstract, see NSA 24 20.
RLO-2017-2 HC$3.00 MF$0.65

X-RAY STRUCTURE INVESTIGATION OF SOME SUBSTITUTED INDOLES, AND THE X-RAY CRYSTAL OF 1, 1'-BISHOMOCUBANE.
California Univ., Berkeley. Lawrence Radiation Lab.
For primary bibliographic entry see Field 20B.
For abstract, see NSA 24 20.
UCRL-19906 HC$3.00 MF$0.65

7D. Physical Chemistry

THE THERMODYNAMICS OF THE ALUMINUM/ALUMINUM VAPOR SYSTEM,
Rand Corp Santa Monica Calif
F. J. Krieger. Aug 70, 39p* Rept no. RM-6335-PR
Contract F44620-67-C-0045

Descriptors: (*Aluminum, *Vaporization), (*Ablation, Aluminum), Vapor pressure, Thermodynamics, Chemical equilibrium, Tables, Enthalpy, Entropy.
Identifiers: Ablative materials.

The 18th in a series of mathematical investigations of the thermodynamics of ablative materials, the study considers aluminum over a range of temperatures up to 6000 deg K and pressures up to 1000 atmospheres. Two sets of equilibrium equations are used--one representing a pure gas phase, the other a heterogeneous system of gas and condensed solid or liquid aluminum. The gas phase of the heterogenous chemical system, like the homogeneous gas phase, comprises 3 gaseous species. Computational results are presented in both tabular and graphic form. The latter comprises (a) a conventional Mollier diagram in which specific enthalpy is plotted against specific entropy, with cross plots of temperature, pressure, and molecular weight of moles of condensed aluminum; (b) a plot of volume versus temperature for aluminum; and (c) a plot of vaporization temperature for aluminum and graphite at various pressures. (Author)
AD-713 095 HC$3.00 MF$0.65

A MOLECULAR ORBITAL INTERPRETATION OF THE SOFT X-RAY L (11,111) EMISSION AND ABSORPTION SPECTRA FROM SOME TITANIUM AND VANADIUM COMPOUNDS.
Technical rept. Jun 69-Jan 70,
Air Force Materials Lab Wright-Patterson AFB Ohio
David W. Fischer. Aug 70, 45p Rept no. AFML-TR-70-88

Descriptors: (*Titanium compounds, *X-ray spectroscopy), (*Vanadium compounds, X-ray spectroscopy), Molecular orbitals, Electron transitions, Oxides, Nitrides, Carbides, Borides.
Identifiers: *Vanadium oxides, *Titanium oxides.

A molecular-orbital energy-level diagram is constructed and used to interpret the metal-ion L (11,111) X-ray emission and absorption spectra from the oxides, nitrides, carbides, and borides of titanium and vanadium. It is shown that the MO model provides a more accurate description of the experimental results than did the ionic model and crossover transition theory. Specific electronic transitions are assigned to spectral components. Anomalous emission peaks which fall on the low energy side of the main L (111) band are found to originate in molecular orbitals which are primarily associated with ligand 2p and 2s levels. (Author)
AD-713 100 HC$3.00 MF$0.65

ESTIMATE OF POTENTIAL SURFACE FOR K-Cl-Cl.
Technical rept.,
Purdue Univ Lafayette Ind Project Squid Headquarters
Carl Nyeland, and John Ross. Sep 70, 28p Rept no. SQUID-TR-MIT-55-PU
Contract N00014-67-A-0226-0005
Prepared in cooperation with Massachusetts Inst. of Tech., Cambridge.

Descriptors: (*Potassium, *Molecular beams), (*Chlorine, Molecular beams), Potential energy, Quantum mechanics, Wave functions.
Identifiers: *Atom molecule interactions, Quantum chemistry, Squid project.

An estimate of the potential surface of the system (K-Cl-Cl) has been made by first considering the configuration (K (+), Cl2 (-)) in a perturbation and variation treatment, and then considering with the aid of a number of approximations the combination of ionic and neutral terms (K, Cl2), (KCl, Cl). (Author)
AD-713 123 HC$3.00 MF$0.65

COMBUSTION KINETICS OF TETRAFLUOROETHYLENE.
Annual summary rept. 1 Jul 69-30 Jun 70,
Drexel Univ Philadelphia Pa Combustion Kinetics Lab
Richard A. Matula. Jul 70, 47p Rept no. DUCK-701 AFOSR-70-2257TR
Grant AF-AFOSR-1606-68

Descriptors: (*Fluorides, *Dissociation), (*Halogenated hydrocarbons, *Combustion), Fluorine compounds, Reaction kinetics, Shock waves, Thermochemistry, Flame propagation, Oxygen, Diffusion, Infrared spectroscopy, Attenuation.
Identifiers: *Carbonyl fluoride, *Fluorine aliphatic compounds, Propene/hexafluoro, Cyclobutene/hexafluoro, Cyclobutane/octafluoro.

The thermal dissociation of carbonyl fluoride (CF2O) in excess argon, CF2O yields CFO +F, was studied behind both incident and reflected shock waves. Preliminary kinetic data have been obtained in the temperature and total pressure ranges 2500-3100K and 0.5-14 atmospheres. The reaction was found to be unimolecular, and the pressure and temperature dependence of the CF2O dissociation rate constant were analyzed with the aid of both the Lindemann and Rice-Ramsperger-Kassel unimolecular theory of reaction rates. Theoretical and experimental values of the spectral absorption coefficient and integrated intensity of the 5.15 micron fundamental band of CF2O are presented. The experimental and theoretical results are in excellent agreement in the temperature range 300-600K and hence it is proposed that the theoretical model can be used to predict the shape and width of this band as a function of temperature. The burning velocities of mixtures of C3F6-O2, c-C4F6-O2 and c-C4F8-O2 at atmospheric pressure are reported. The peak burning velocity of fluorocarbon-oxygen flames can not be correlated with peak adiabatic flame temperature but they can be correlated with peak calculated equilibrium fluorine atom concentrations. (Author)
AD-713 144 HC$3.00 MF$0.65

INTRAMOLECULAR PROTON TRANSFER IN THE EXCITED SINGLET STATE OF 3-HYDROXY-2-NAPHTHOIC ACID.
Technical rept.,
Minnesota Univ Minneapolis Dept of Chemistry
William R. Ware, and P. R. Shukla. 14 Sep 70, 27p Rept no. TR-6
Contract N00014-67-A-0113-0006
Supplement to Technical rept. no. 4, AD-683 797.

Descriptors: (*Carboxylic acids, *Fluorescence), Naphthalenes, Phenols, Solutions, Molecular association, Exchange reactions, Chemical equilibrium, Organic solvents, Electron transitions, Excitation.
Identifiers: Emission spectra, *Naphthoic acid/3-hydroxy, Proton transfer.

Studies of fluorescence quenching via intramolecular proton transfer are described for the systems 3-hydroxy-2-naphthoic acid in several solvents. It has been found that bases which promote the proton transfer in non-polar solvents function by parallel static and dynamic mechanisms and that the mechanism proposed by Hirota, which assumes rapid establishment of the proton transfer equilibrium during the lifetime of the excited state, is inadequate. The mechanisms of both the static and the dynamic processes have been investigated by using fluorescence lifetime techniques and by making steady-state fluorescence quenching measurements. The results for various solvents and various temperatures are reported for the acid, its methyl ester, and the corresponding methoxy derivative. (Author)
AD-713 164 HC$3.00 MF$0.65

NANOSECOND TIME-RESOLVED EMISSION SPECTROSCOPY: SPECTRAL SHIFTS DUE TO SOLVENT-EXCITED SOLUTE RELAXATION.
Technical rept.,
Minnesota Univ Minneapolis Dept of Chemistry
William R. Ware, Sai K. Lee, Gary J. Brant, and Peter P. Chow. 28 Sep 70, 37p Rept no. TR-7
Contract N00014-67-A-0113-0006

Descriptors: (*Imides, *Fluorescence), Solutions, Propanols, Phthalic acids, Electron transitions, Molecular orbitals, Relaxation time, Excitation.
Identifiers: *Phthalimide/amino, Emisson spectra.

Nanosecond time-resolved emission spectral techniques have been applied to the problem of the origin and nature of the well-known temperature-dependent spectral shifts characteristic of the aminophthalimides in alcohol solvents. It is demonstrated that the temperature-dependent spectral shifts are in fact due to time-dependent spectral shifts. At least two relaxation times characterize this phenomenon. One relaxation time is observed to be subnanosecond in character and may be associated with the exciplex that presumably is present in the system. The other relaxation time is presumably associated with the non-specific dipolar reorientation although it has distinctly different characteristics from the solvent dielectric relaxation time. Wavelength-dependent fluorescence decay that can be explained by the time dependence of the emission spectrum is also observed. (Author)
AD-713 177 HC$3.00 MF$0.65

NANOSECOND TIME RESOLVED EMISSION SPECTROSCOPY OF 1-ANILINO-8-NAPHTHALENE SULFONATE.
Technical rept.,
Minnesota Univ Minneapolis Dept of Chemistry
William R. Ware, and Saroj Chakrabarti. 28 Sep 70, 22p Rept no. TR-8
Contract N00014-67-A-0113-0006

Descriptors: (*Naphthalenes, *Fluorescence), Emissivity, Sulfonates, Spectra (Visible + ultraviolet), Electron transitions, Solutions, Propanols, Relaxation time, Excitation.
Identifiers: *Naphthalene sulfonic acid/anilino, Emission spectra.

Fluorescence lifetimes, steady-state and time-dependent fluorescence spectra of 1-anilino-8-naphthalene sulfonate (ANS) have been measured at several temperatures and in a variety of solvents. The fluorescence of ANS showed a large

temperature-dependent spectral shift as well as time dependent spectral shifts in the nanosecond range. The results are interpreted in terms of solvent-excited solute relaxation processes involving the lowest excited singlet state of ANS. It was also found that at least part of the increase in the fluorescence quantum yield with decreasing solvent polarity involves an increase in the radiative transition probability. (Author)
AD-713 178 HC$3.00 MF$0.65

RESEARCH ACTIVITIES IN THE FIELD OF MATERIALS SCIENCE.
North Carolina Univ Chapel Hill Materials Research Center
For primary bibliographic entry see Field 11G.
AD-713 198 HC$3.00 MF$0.65

PHOTOCONDUCTIVE AND PHOTOVOLTAIC EFFECTS IN DIBENZOTHIOPHENE AND ITS MOLECULAR COMPLEXES,
Air Force Cambridge Research Labs L G Hanscom Field Mass
Tapan K. Mukherjee. 22 Aug 69, 11p Rept no. AFCRL-70-0506
Availability: Pub. in Jnl. of Physical Chemistry, v74 n15 p3006-3014 1970.

Descriptors: (*Thiophenes, *Photoconductivity), (*Complex compounds, Thiophenes), Fluorescence, Carriers (Semiconductors), Excitons, Quenching (Inhibition), Fluorenones, Nitriles.
Identifiers: *Dibenzothiophenes, *Photovoltaic effect, *Charge transfer complexes, Nitro compounds, Malononitriles, Organic semiconductors.

The photoconductivity of dibenzothiophene crystals was measured in the sandwich and surface type cells. The photocurrent spectral response and the supression of photocurrent by small amount of fluorescence quencher tetracene demonstrate that optical excitation in the 340-230-m microns region generates carriers by a mechanism involving singlet exciton states. Mobile holes are majority carriers. Hole trapping, which modifies the conductivity type, can be accomplished by doping with electron acceptors. The photo emf consists of two stages; the fast rising positive emf in the region of low optical absorption changes sign in the stationary state. From the rise and decay characteristics of the short-circuit in the regions of high and low optical absorption it is concluded that part of the total photo emf is diffusion controlled. The magnitude of the photovoltage in dibenzothiophene can be sensitized by doping with 2,7-dinitrofluoren-delta (9 alpha)-malononitrile (DDF), 1,3,5-trinitrobenzene (TNB), and 2,4,5,7-tetranitrofluorenone (T4NF). Dibenzothiophene-T4NF complex, the best photoconductor of this series, was investigated in some detail. Electrons are found to be the majority carriers in this complex. A comparison of the photoconductivity and fluorescence of dibenzothiophene with anthracene did not yield any meaningful correlation between the two phenomena. In the case of dibenzothiophene crystal, the photoconductivity seems to be independent of the self-quenching process. (Author)
AD-713 205

POLYELECTROLYTES IN SOLUTION - THEIR CONFORMATION AND TURBULENT FLOW CHARACTERISTICS.
Massachusetts Inst of Tech Cambridge Dept of Chemical Engineering
For primary bibliographic entry see Field 20D.
AD-713 217 HC$3.00 MF$0.65

RESEARCH DIRECTED TOWARD THE EXPERIMENTAL INVESTIGATION OF METHODS OF ANALYZING SO2:SO3 RATIOS IN JET EXHAUSTS.
Final rept. 15 Aug 66-14 Aug 69,
Barkley and Dexter Labs Inc Fitchburg Mass
Lawrence R. Day, Edwin C. Dunton, Raymond B. Wilson, and Michael Zinchuk. 6 May 70, 32p AFCRL-70-0279
Contract AF 19 (628)-6137

Descriptors: (*Jet engines, *Exhaust gases), (*Air pollution, Exhaust gases), (*Ultraviolet detectors, *Sulfur compounds), Test methods, Dioxides, Oxides, Chemical analysis, Infrared detectors, Concentration (Chemistry), Ionization.
Identifiers: *Sulfur dioxide, *Sulfur trioxide, *Air pollution detection.

Research was directed towards the analysis of SO2/SO3 ratios in jet exhausts at temperatures of 600C and Mach I gas streams. Spectral absorbance measuring techniques in the ultra violet region of the spectrum appeared to offer the best method of measurement. Equipment was designed and developed incorporating these techniques. Other aspects of jet exhausts were also investigated including contrail scattering and ionization effects. Equipment was also developed for the measurement of infrared radiation from a jet engine. (Author)
AD-713 222 HC$3.00 MF$0.65

HYDROGEN SCRAMBLING IN ORGANIC IONS AS A FUNCTION OF INTERNAL ENERGY. EXTENSION OF THE ENERGY RANGE,
Cornell Univ Ithaca N Y Dept of Chemistry
For primary bibliographic entry see Field 7C.
AD-713 230

FUSION PROPERTIES OF SOME IONIC QUATERNARY AMMONIUM COMPOUNDS.
Technical rept.,
Rensselaer Polytechnic Inst Troy N Y Dept of Chemistry
T. G. Coker, J. Ambrose, and G. J. Janz. Sep 70, 21p Rept no. TR-5
Contract N00014-67-A-0117-0006

Descriptors: (*Ammonium compounds, *Melting), (*Heat of fusion, Ammonium compounds), Enthalpy, Entropy, Crystal structure, Halides.
Identifiers: *Quaternary ammonium salts, *Fusion (Melting).

Enthalpy, entropy and molar volume changes during the fusion process of a wide range of quaternary ammonium compounds are presented. This group of compounds has hitherto been unexplored and is of interest since, as far as melting mechanisms are concerned, it is related to two groups of compounds whose melting phenomena has been studied extensively, the n-paraffins and the alkali metal halides. The data are examined for general trends and comparisons are made with similar data for the paraffins and alkali metal halides. Some regularities in the entropy changes are noted and can be correlated with structural changes within the cation. (Author)
AD-713 233 HC$3.00 MF$0.65

OPTICAL SPECTRA OBSERVED DURING ION-MOLECULE COLLISIONS WITH LOW-ENERGY N2 (+) AND Ar (+) BEAMS.
Technical rept.,
California Univ Santa Barbara
Chelcie Bosland Liu. Sep 69, 215p Rept no. TR-28
Contract Nonr-4222 (01), ARPA Order-1479
Doctoral thesis.

Descriptors: (*Spectra (Visible + ultraviolet), *Ion bombardment), (*Argon, Ion beams), (*Nitrogen, Ion beams), Diatomic molecules, Molecular energy levels, Excitation, Hydrogen, Deuterium, Carbon monoxide, Vibration, Oxygen, Nitrogen oxides, Carbon dioxide, Methane, Theses.
Identifiers: *Ion molecule interactions, Acetylene, *Collision cross sections, *Collisional energy transfer.

A spectroscopic study has been made of the light emitted during ion-molecule collisions using Ar (+) and N2 (+) beams at laboratory energies ranging from 10 to 1000 eV Target gases for both ions included H2, D2, CO, N2, NO, N2O, CO2, CH4, and C2H2; in addition, He, Ne Ar and Kr were used as N2 (+) targets. Preliminary spectra of the reactions He (+) + CO2 and Ar (+) + Ar also were obtained. Photon emission in the visible and near ultraviolet was found to be a common occurrence for ion-molecule reactions in this energy range. Several different types of reactions have been found which lead to electronically, rotationally and vibrationally excited states. Absolute cross sections for the production of some of the bright features observed in these reactions have been measured. Rotational and vibrational excitation of the collision products have been studied. In general, the rotational excitation increased as the energy of the bombarding ion decreased. A 'billiard ball' model of the collision is presented which gives a semiquantitative explanation of the dependence of rotational excitation on the energy and identity of the incident ion for 'grazing' collisions. The degree of vibrational excitation and its energy dependence depended on the reaction partners. (Author)
AD-713 236 HC$3.00 MF$0.65

CRYSTALLIZATION KINETICS OF DILUTE POLYETHYLENE SOLUTIONS,
Florida State Univ Tallahassee
C. Devoy, L. Mandelkern, and L. Bourland. 16 Sep 69, 17p AROD-4222:22-C
Contract DAHC04-69-C-0040
Sponsored in part by the Atomic Energy Commission, Washington, D. C.
Availability: Pub. in Jnl. of Polymer Science, Pt A-2, v8 p869-882 1970.

Descriptors: (*Polymers, *Crystallization), (*Polyethylene plastics, Crystallization), Solutions, Dilatometers, Reaction kinetics, Free energy, Nucleation, Organic solvents.

The crystallization kinetics of a high molecular weight fraction of linear polyethylene was studied in dilute solutions of p-xylene, n-hexadecane, and decalin by dilatometric methods. For all solvents and temperatures, the experimental isotherms could be quantitatively described by the Avrami formulation for the complete transformation. This result is unique in the realm of polymer crystallization, since marked deviations from this theory are usually observed in more concentrated systems. The Avrami exponent is found to be n = 4 in all cases. The temperature coefficients of the rate constants are indicative of a nucleation controlled process. The data fit either a two-dimensional or three-dimensional nucleation mode, and a discrimination can not be made between these two cases. The interfacial free energies are found to be independent of the solvent medium. It is also shown that, irrespective of the type of nucleation control governing the kinetics, the same type governs the crystallite thickness of the lamella-like crystals that are formed. (Author)
AD-713 237

HEAT CAPACITY STUDIES OF INTERMETALLIC COMPOUNDS CONTAINING RARE EARTH ELEMENTS,
Pittsburgh Univ Pa Dept of Chemistry
For primary bibliographic entry see Field 20L.
AD-713 250

CONTACT-POTENTIAL CHANGES PRODUCED ON METAL SURFACES BY TENSILE STRESSES,
Virginia Univ Charlottesville Dept of Physics
For primary bibliographic entry see Field 20C.
AD-713 251

NATURE OF SOLVENT EFFECTS ON THE PROTON CHEMICAL SHIFTS OF NONPOLAR SOLUTES,
Stevens Inst of Tech Hoboken N J Dept of Chemistry and Chemical Engineering
Edmund R. Malinowski, and Paul H. Weiner. 10 Jan 70, 8p AROD-3930:18-C
Contract DA-31-124-ARO (D)-90
Presented at Metro Chem 69, Regional Meeting of the New York and North Jersey Section of the American Chemical Society, New York, N. Y.
Availability: Pub. in Jnl. of the American Chemical Society, v92 n14 p4193-4197, 15 Jul 70.

Descriptors: (*Nuclear magnetic resonance, Solvent action), Benzene, Sulfides, Organic solvents, Carbon compounds.
Identifiers: *Chemical shifts (Nuclear magnetic resonance), Carbon disulfide.

Chemical shifts of nonpolar solutes in various solvents are referenced relative to external hexamethyldisiloxane by utilizing a spinning coaxial sample technique. From a graphical analysis, values for the various factors which contribute to the solvent shifts are deduced. Values for van der Waals terms agree quantitatively with the binary collision model of Bernstein. Solvent anisotropy contributions for benzene and carbon disulfide are compared with the theoretical estimations of Schug. Furthermore, gas-phase shifts of nonpolar molecules are predicted from the graphs. (Author)
AD-713 261

THERMOCHEMISTRY OF LIQUID BORATES. II. PARTIAL ENTHALPIES OF SOLUTION OF BORIC OXIDE IN ITS LIQUID MIXTURES WITH LITHIUM, SODIUM, AND POTASSIUM OXIDES,
Chicago Univ Ill James Franck Inst
T. Ostvold, and O. J. Kleppa. 12 Nov 69, 9p AROD-5107:25-MC
Grant DA-ARO (D)-31-124-G961
Availability: Pub. in Inorganic Chemistry, v9 n6 p1395-1400 Jun 70.

Descriptors: (*Borates, *Thermochemistry), (*Phase studies, Borates), Thermodynamics, Sodium compounds, Lithium compounds, Potassium compounds, Oxides, Free energy, Enthalpy, Entropy.
Identifiers: *Fused salts, Lithium oxides, Sodium oxides, Potassium oxides, Boron oxides.

The partial enthalpies of solution of B2O3 in its liquid mixtures with Li2O, Na2O, and K2O have been measured at 940C (Li2O-B2O3, 0.4 < N (B2O3) < 1.0) and at 985C (Na2O-B2O3, 0.5 < N (B2O3) < 1.0; K2O-B2O3, 0.7 < N (B2O3) < 1.0). In all these systems the partial enthalpy of B2O3 is slightly positive in the high B2O3 range (N (B2O3) > 0.85-0.90) but becomes negative at lower B2O3 contents, the exothermic character increasing in the sequence Li2O-B2O3 < Na2O-B2O3 < K2O-B2O3. The results are discussed in terms of recent observations of subliquidus immiscibility in alkali borate glasses and of attempts to derive structural information on the nature of borate species in the melts from phase diagram data. (Author)
AD-713 265

MECHANISMS OF EXCITED STATE DEACTIVATION. QUENCHING OF EXCITED SINGLETS BY NUCLEOPHILES,
North Carolina Univ Chapel Hill Dept of Chemistry
D. G. Whitten, J. W. Happ, G. L. B. Carlson, and M. T. McCall. 17 Feb 70, 5p AROD-8168:4-C
Grant DA-ARO (D)-31-124-G1097
Sponsored in part by the National Science Foundation, Washington, D. C.
Availability: Pub. in Jnl. of the American Chemical Society, v92 p3499-3500.

Descriptors: (*Fluorescence, *Quenching (Inhibition)), Excitation, Molecular energy levels, Vitamin B complex, Fluoborates.
Identifiers: *Nucleophilic reactions, Quantum interactions.

The quenching of fluorescence of several electron-deficient compounds by a variety of nucleophiles is reported. This quenching apparently is caused by addition of nucleophiles to excited singlet states; attack by nucleophiles may lead to addition products but in many cases addition followed by elimination simply provides a mechanism for radiationless deactivation. (Author)
AD-713 271

ELECTRONIC AND VIBRATIONAL SPECTROSCOPY IN A NEMATIC LIQUID CRYSTAL SOLVENT. BAND POLARIZATIONS FOR BINUCLEAR METAL CARBONYLS,
California Inst of Tech Pasadena
Robert A. Levenson, Harry B. Gary, and Gerald P. Ceasar. 6 Oct 69, 9p Rept no. Contrib-3957 AROD-8389:1-C
Grant DA-ARO (D)-31-124-G1113
Availability: Pub. in Jnl. of the American Chemical Society, v92 n12 p3653-3658, 17 Jun 70.

Descriptors: (*Metal carbonyls, *Spectra (Infrared)), (*Infrared spectroscopy, *Organic solvents), (*Ultraviolet spectroscopy, Organic solvents), Polarization, Molecular energy levels, Manganese compounds, Rhenium compounds.
Identifiers: *Liquid crystals, *Dinuclear metal complexes, Manganese carbonyls, Rhenium carbonyls, Carbonic acid/ (butyl-ester)- (((ethoxyphenoxy)carbonyl)phenyl-ester).

A new technique for obtaining the polarizations of infrared and electronic absorption bands is discussed in detail and illustrated by application to certain binuclear metal carbonyls of the type M2 (CO)10. In this method orientation is achieved by dissolving the molecule of interest in a nematic liquid crystal host which is subsequently aligned by a simple rubbing procedure. Infrared polarization data for the binuclear metal carbonyls in nematic solution rigorously establish the assignments of the CO stretching bands. The infrared results also determine that the sign of the ordering factor S (zz), which describes solute orientation, is positive, indicating parallel alignment of the M2 (CO)10 molecules with the nematic host. The degree of orientation obtained by the simple rubbing procedure used in these experiments is comparable to that achieved in liquid crystal nmr experiments. The polarized electronic spectra of Mn2 (CO)10 in nematic solution show that the first very intense band is polarized along the metal-metal bond. The band is assigned d-sigma (M-M) to d-sigma* (M-M). (Author)
AD-713 279

TIME DEPENDENCE OF STREAMING BIREFRINGENCE OF POLYSTYRENE SOLUTIONS IN AROCLOR,
Research Triangle Inst Durham N C Camille Dreyfus Lab
P. Munk, and A. Peterlin. 6 Aug 69, 14p AROD-6995:4-C
Contract DAHC04-67-C-0038
Revision of report dated 14 Apr 69.
Availability: Pub. in Transactions of the Society of Rheology, v14 n1 p65-75 1970.

Descriptors: (*Styrene plastics, *Birefringence), (*Polymers, Birefringence), Solutions, Diphenyl, Halogenated hydrocarbons, Shear stresses.

The streaming birefringence of dilute solutions of polystyrene in Aroclor was studied. The stress-optical coefficient is time independent. The phenomenon is apparently connected with formation of aggregates during flow. (Author)
AD-713 287

COMPUTER PROFILES OF He I 5016 A AT HIGH ELECTRON DENSITIES,
Colorado Univ Boulder Dept of Physics and Astrophysics
J. Cooper, and A. J. Barnard. 11 Nov 69, 11p AROD-4445:168-P
Contract DA-31-124-ARO (D)-139
Prepared in cooperation with British Columbia Univ., Vancouver. Dept. of Physics. Sponsored in part by Atomic Energy Control Board of Canada.
Availability: Pub. in Jnl. of Quantitative Spectroscopy and Radiation Transfer, v10 p695-702 1970.

Descriptors: (*Helium, *Electron transitions), (*Stark effect, Helium), Electron density, Atomic spectroscopy, Line spectrum, Programming (Computers), Ions.

Profiles of He I 5016 A and its forbidden component have been calculated and are tabulated for electron densities from 3 x 10 to the 16th to 6 x 10 to the 17th/cu cm and temperatures from 10,000 to 80,000 K. The ion broadening is treated in the quasistatic approximation and the electron broadening of the overlapping Stark components in the impact approximation. The effect of the broadening of the lower level by electrons has been taken into account, and intermediate states up to n = 6 have been included. (Author)
AD-713 290

MEASUREMENT OF (partial derivative of P/partial derivative of T) sub V AND RELATED PROPERTIES IN SOLIDIFIED GASES. III. SOLID D2,
Duke Univ Durham N C Dept of Physics
Dietolf Ramm, Horst Meyer , and Robert L. Mills. 27 Oct 69, 17p AROD-4357:20-P
Grant DA-ARO-D-31-124-70-G20
Prepared in cooperation with Los Alamos Scientific Lab., N. Mex.
Availability: Pub. in The Physical Review B, v1 n6 p2763-2776, 15 Mar 70.

Descriptors: (*Deuterium, *Equations of state), (*Solidified gases, Deuterium), Thermodynamics, Pressure, Phase studies, Transition temperature.

Measurements in solid D2 of pressure changes with temperature and para concentration are reported, and related thermodynamic properties are calculated. The study covers both the hcp and cubic phases in the temperature range 0.4 to 4.2K and para concentration range 0.02 to 0.90. The measurements were carried out with a capacitance strain gauge. The results were analyzed in terms of separate contributions from the lattice and from the rotation of the paradeuterium molecules (p-D2, lowest rotational level J = 1). The molecular rotation was assumed to be quenched by the electric quadrupole-quadrupole (EQQ) interaction, and all other effects such as those due to crystalline field were neglected. The EQQ interaction parameter Gamma was determined experimentally. The results from extend the phase diagram to low para concentrations and show that the transition from the hcp to the cubic phase does not take place below c = 0.55. The data from thermal cyclings, when analyzed in conjunction with corresponding data from x-ray diffraction, indicate that the changes in pressure (and in other thermodynamic properties) are due mainly to the order-disorder transition of the rotational motions and not to the crystalline phase change per se. The results from give values of Gamma (eff) (pair)/k (B) = 1.05 plus or minus 0.07K and Gamma (eff) (c = 1)/k (B) = 0.93 plus or minus 0.05K for low and high concentrations of p-D2, respectively. (Author)
AD-713 293

DETECTION OF SINGLY STIMULATED TWO-PHOTON EMISSION FROM METASTABLE DEUTERIUM ATOMS,
Bendix Corp Southfield Mich Bendix Research Labs
P. Braeunlich, and P. Lambropoulos. 1 Jun 70, 7p AROD-7891:1-P
Contract DAHC04-69-C-0030
Availability: Pub. in Physical Review Letters, v25 n3 p135-138, 20 Jul 70.

Descriptors: (*Deuterium, Emissivity), Excitation, Atomic energy levels, Deuterons.

The observation of singly stimulated two-photon emission from metastable deuterium atoms is reported. A collimated beam of metastables is produced by charge exchange between cesium vapor and 5-keV deuterons. A pulsed Md-glass laser is used for the stimulation. The generated 1373-A photons are detected at the exit slit of a spectrometer. Single-photon counting techniques are employed. The results obtained are in good agreement with theoretical calculations. (Author)
AD-713 298

POLYMOLEKULARITATSUNTERSUCHUNGEN AN REGENERATCELLULOSEN MIT HILFE VON MOLEKULARSIEBEN (Investigation of the Chain-Length Distribution of Regenerated Cellulose Products by Gel Filtration Chromatography),
Svenska Traforskningsinstitutet Stockholm
Bo A. Pettersson, and Erich Treiber. 1969, 6p Rept nos. Meddelande-11, KA-2
Text in German. Also includes MA-6.
Availability: Pub. in Das Papier, v3 p139-143 Mar 60. No copies furnished.

Descriptors: (*Cellulose, *Molecular weight), Chromatographic analysis, Sweden.
Identifiers: *Regenerated cellulose, Gel permeation chromatography.

A method for investigating the molecular weight distribution of cellulosic materials has been used to study some regenerated cellulose samples. The procedure involves gel filtration chromatography of cadoxen solutions on an agarose gel. Elution diagrams reflecting the molecular weight distribution of e.g. HWM- and polynosic fibres are presented. Some of the samples which had approximately the same degree of polymerisation gave rather different elution diagrams. Products of similar mechanical properties may also be assumed to have varying DP-values and polydispersities. (Author)
AD-713 306

SPINODAL DECOMPOSITION,
Northwestern Univ Evanston Ill Dept of Materials Science
J. E. Hilliard. 1970, 66p AROD-4975:8-MC
Contract DA-31-124-ARO (D)-233
Availability: Pub. in Phase Transformations, p497-557 1970.

Descriptors: (*Phase studies, *Diffusion), Glass, Alloys, Mathematical analysis, Crystal structure, Aluminum alloys, Zinc alloys, Silver alloys, Silicon dioxide, Alumina, Solid solutions.
Identifiers: *Phase transformations, Spinodal decomposition, Sodium oxides, Binary systems (Materials), Boron oxides, Lead oxides.

Theoretical and experimental work on spinodal decomposition is reviewed. (Author)
AD-713 310

SOLVENT EXTRACTION OF VOLTILE DIVALENT METAL FLUORO-BETA-DIKETONATES,
Monsanto Research Corp Dayton Ohio Dayton Lab
W. G. Scribner, and R. E. Sievers. 1969, 13p ARL-70-0224W
Contract F33615-69-C-1062
Availability: Pub. in Solvent Extraction Research, p1-11 1969.

Descriptors: (*Complex compounds, *Solvent extraction), Ketones, Chelate compounds, Halogenated hydrocarbons, Fluorine compounds, Gas chromatography.
Identifiers: *Pentane dione complexes, Diketones, Pentane dione/trifluoro-2-4, Fluorine aliphatic compounds.

The combination of solvent extraction of metal fluoroacetylacetonates and gas chromatography has been employed for the determination of metals or metal mixtures. Extraction of an aqueous solution of metal ions with an organic solvent containing trifluoroacetylacetone yields an organic solution of a volatile metal trifluoroacetylacetonate which may be suitable for injection into a gas chromatograph. (Author)
AD-713 322

TRANSITION PROBABILITIES FOR THE PROMINENT RED LINES OF Ne I,
National Bureau of Standards Washington D C
J. M. Bridges, and W. L. Wiese. 16 Mar 70, 9p
Availability: Pub. in Physical Review A, v2 n2 p285-293 Aug 70.

Descriptors: (*Neon, *Electron transitions), Atomic spectroscopy, Atomic energy levels.

Relative transition probabilities of all 30 lines belonging to the prominent 3s-3p transition array of Ne I have been measured in emission with a wall-stabilized arc operating in an argon-neon mixture at atmospheric pressure. The data have been normalized to an absolute scale provided by recent lifetime measurements of the 3p levels. Our results, as well as the data from other emission measurements, have been subjected to extensive comparisons and tests, including a check for fulfillment of the J-file sum rule. It is found that our data exhibit a much better consistency than any other set of individual values. On the basis of this analysis as well as our uncertainty estimates, we estimate that the accuracy of our individual transition probabilities for this transition array, except for a few weak lines, is of the order of 10% on an absolute basis. (Author)
AD-713 324

PRODUCTION OF singlet S METASTABLE OXYGEN ATOMS IN HELIUM-OXYGEN POSITIVE COLUMNS,
Queen'S Univ Belfast (Northern Ireland) School of Physics and Applied Mathematics
J. W. McConkey, K. A. Moran, and K. G. Emeleus. 28 Mar 70, 4p ARL-70-0231W
Grant AF-EOAR-42-67
Availability: Pub. in Physics Letters, v31A n9 p487-488, 4 May 70.

Descriptors: (*Oxygen, *Electron transitions), (*Gas discharges, Oxygen), Atomic energy levels, Helium, Mixtures, Excitation, Great Britain.

A brief account is present of the main observations and conclusions resulting from a comprehensive study of 5577 A OI emission from He-O2 discharges. (Author)
AD-713 327

ZUR VISKOSITATSKORRIGIERUNG DES FILTERWERTES VON VISKOSEN (Correction of Viscosity of the Filter Constants of Viscose),
Svenska Traforskningsinstitutet Stockholm
For primary bibliographic entry see Field 11L.
AD-713 332

A METHOD FOR THE ONE-DIMENSIONAL THIN-LAYER CHROMATOGRAPHIC SEPARATION OF SERUM PHOSPHOLIPIDS.
Naval Medical Research Inst Bethesda Md
For primary bibliographic entry see Field 6A.
AD-713 341

UBER TEMPERATURUNTERSCHIEDE IN DER ALKALIZELLULOSE BEI DER FASERXANTHOGENIERUNG (The Temperature Difference in Alkali Cellulose During Xanthation of the Fibers),
Svenska Traforskningsinstitutet Stockholm
Dag Ehrengard, and Erich Treiber. 1969, 3p Rept nos. Meddelande-19, MA-10
Text in German.
Availability: Pub. in Schwedisches Holzforschungsinstitut, Stockholm. No copies furnished.

Descriptors: (*Cellulose, Chemical reactions), (*Viscose, *Heat of reaction), Thermal conductivity, Calorimetry, Sweden.
Identifiers: *Xanthation, Esterification, *Cellulose xanthate, Carbon disulfide.

Since alkali cellulose has low thermal conductivity, during the processing of shredded alkali cellulose, temperature can vary appreciably within a given sample. For a dry xanthation process, these temperature differences, which depend upon several parameters, have been studied experimentally. (Author)
AD-713 345

BEITRAG ZUR KENNTNIS DER WAERMETOENUNG DER XANTHOGENIERUNGSREAKTION. (Contribution to the Knowledge of the Heat of Reaction of the Xanthation Process),
Svenska Traforskningsinstitutet Stockholm
von Istvan Czajlik, and Erich Treiber. 1969, 6p Rept nos. Meddelande-30, MA-24
Text in German.
Availability: Pub. in Holzforschung, v23 n4 p133-135 Aug 69. No copies furnished.

Descriptors: (*Viscose, *Heat of reaction), Chemical reactions, Calorimetry, Sweden.
Identifiers: *Xanthation, Esterification, *Cellulose xanthate, Carbon disulfide.

After a survey of the exothermic reactions in the viscose process, experiments on the determination of the heat of reaction of the xanthation process are reported. For the total reaction 12 kcal/Mol CS2 have been found in accordance to Grotjahn. The heat of the real xanthation reaction is estimated to be less than 10 kcal/Mol CS2. (Author)
AD-713 346

COLLISION-INDUCED DISSOCIATION OF NO (+) AND O2 (+) AT LOW KINETIC ENERGIES: EFFECTS OF INTERNAL IONIC EXCITATION,
Aerospace Research Labs Wright-Patterson AFB Ohio
Thomas O. Tiernan, and Ronald E. Marcotte. 25 Mar 70, 18p Rept no. ARL-70-0230W
Availability: Pub. in Jnl. of Chemical Physics, v53 n5 p2107-2122, 1 Sep 70.

Descriptors: (*Nitrogen oxides, *Dissociation), (*Oxygen, Dissociation), Ion beams, Interactions.
Identifiers: *Ion molecule interactions.

The reactions resulting in dissociation of NO (+) and O2 (+) upon impact with various atoms and molecules have been investigated in a double mass spectrometer of in-line geometry in the reactant ion kinetic energy range below 50 eV. Cross sections measured for these processes range from about 0.02 to 0.3 sq A. The dependence of the cross section upon kinetic energy is markedly affected by the energy of the ionizing electrons which produce the reactants. At the lowest electron energy, E (c) = 13 eV, kinetic-energy thresholds are observed for the production of N (+) from the NO (+)/NO reaction, and for O (+) production from the O2 (+)/Ar reaction, which are in excellent agreement with known adiabatic dissociation energies for the ground-state molecule ions. The production of O (+) from the NO (+)/NO interaction is shown to involve a rearrangement process rather than simple collision-induced dissociation. These results and related charge transfer experiments with NO (+) indicate that the reactant ion beam formed by 20-eV electrons includes both vibrationally excited ground-state ions and NO (+) ions in the triplet Delta electronic state. Isotopic experiments in which 15NO (+) and N18O (+), respectively, were impacted at low energies on normal NO demonstrate that the N (+) and O (+) products are derived in approximately equal amounts from the reactant ion and reactant molecule. (Author)

AD-713 412

CONSECUTIVE METASTABLE PEAKS IN MASS SPECTRA,
Utah State Univ Logan Dept of Chemistry
Lorin P. Hills, Jean H. Futrell, and Austin L. Wahrhaftig. 7 Jul 69, 7p ARL-70-0229V
Contract F33615-68-C-1022
Availability: Pub. in Jnl. of Chemical Physics, v51 n12 p5255-5259, 15 Dec 69.

Descriptors: (*Mass spectroscopy, *Ionization), Ions, Mathematical analysis.
Identifiers: *Metastable molecules.

The observation of consecutive metastable peaks in mass spectra has prompted a calculation for the abundance of these species. Expressions for fractional abundance as a function of primary and secondary rates and residence times are derived for all species of normal and metastable ions. Primary and secondary rates for a toluene consecutive dissociation were calculated using the method of Vestal, Wahrhaftig, and Johnston, and the breakdown curves were determined. By assuming a constant energy-transfer function, the normalized areas of the calculated curves are found to compare vary favorably with the mass spectrum obtained in this laboratory with a double-focusing mass spectrometer. (Author)
AD-713 417

THERMODYNAMICS OF THE CORROSION INHIBITION OF IRON IN THE Fe/H2O, H2O2, O2 SYSTEM,
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 11F.
AD-713 451 HC$3.00 MF$0.65

FREQUENCY-DEPENDENT POLARIZABILITY OF H2 CALCULATED BY MANY-BODY THEORY.
Journal reprint,
Virginia Univ Charlottesville Dept of Physics
Hugh P. Kelly. 10 Oct 69, 8p ARL-70-0223W
Contract F33615-69-C-1048
Availability: Pub. in Physical Review, v1 n2 p274-279 Feb 70.

Descriptors: (*Hydrogen, Polarization), Perturbation theory, Dipole moments.

Many-body perturbation theory is used to calculate the parallel and perpendicular dynamic polarizabilities of molecular hydrogen. High-order terms in the perturbation expansion are included and the poles of alpha (omega) are calculated. Results for the dynamic dipole polarizabilities and for the molecular anisotropy are in good agreement with experiment. (Author)
AD-713 466

SENSITIVITY FUNDAMENTALS.
Semiannual technical progress rept. 1 Mar-31 Aug 70,
Stanford Research Inst Menlo Park Calif
2 Oct 70, 55p
Contract N00014-70-C-0190

Descriptors: (*Organic nitrogen compounds, *Detonations), Shock waves, Sensitivity, Reaction kinetics, Pyrolysis.
Identifiers: *Nitro compounds, *Propane/dinitro, Chemical reaction mechanisms.

Sensitivity properties of dinitroalkanes were studied. They included the low-velocity detonation (LVD) wave characteristics of the liquid phase, the relation of shock sensitivity and failure diameter to the flow and the chemical reaction rate behind the shock front, and the kinetics and mechanisms of thermal decomposition of the compounds in the gas phase. The compounds chosen for this study were structurally simple but at the same time have physical properties that permit their use in each phase of the study. The model compounds of the current study are selected dinitropropane isomers. Like the difluoraminoalkane isomers used in previous studies, these compounds are being used so that the results from each experimental technique can be interrelated without having to account for effects caused by different functional groups, amount of carbon content, and chain branching. (Author)
AD-713 474 HC$3.00 MF$0.65

EXPERIMENTAL STUDY OF THE LAMBDA TRANSITION OF LIQUID HELIUM USING FIRST SOUND ATTENUATION.
Technical rept.,
California Univ Los Angeles Dept of Physics
Richard D. Williams. Sep 70, 89p Rept no. TR-32
Contract N00014-69-A-0200-4014

Descriptors: (*liquefied gases, *Superfluidity), (*Helium, Phase studies), Transition temperature, Cryogenics, Attenuation, Ultrasonic radiation, Theses.
Identifiers: *Liquid helium, Lambda transition, First sound, Ultrasonic attenuation.

The attenuation of first sound near the lambda point can be interpreted as being due to two phenomena: (1) a relaxation process described by Pokrovskii and Khalatnikov occurring only below the lambda point, and having a relaxation time of XiC2 where C2 is the velocity of second sound and Xi is a coherence length of magnitude 1.36 x 10 to the minus 8th power ((T sub Lambda)-T) to the minus 2/3 power cm; (2) a critical attenuation which is non-singular and symmetrical about T sub Lambda. (Author)
AD-713 478 HC$3.00 MF$0.65

PHASE BEHAVIOR IN FLUID MIXTURES AT HIGH PRESSURES. I. EXPERIMENTAL,
Military Academy West Point N Y
James L. E. Hill, and William B. Streett. 1970, 14p

Descriptors: (*Phase studies, High-pressure research), Liquefied gases, Helium, Argon, Cryogenics, Pressure, Temperature.

The work reported here represents part of a long-term research objective of determining accurate experimental liquid-vapor phase equilibrium data on binary fluid mixtures in the temperature range 13-160 Kelvin and at pressures up to 4000 atm. Systems under investigation are those in which, under these conditions, one component is normally a gas and the other is a liquid. These substances are among those with the lowest critical temperatures and the simplest molecular structures. The gas-liquid critical curve extending into pressure-temperature-composition (PTX) space, from the critical point of argon, has been well-defined by eleven experimental points. It was found to pass through a minimum in temperature at 147.1K, and a pressure of 440 atm. These results confirm the presence of fluid-fluid equilibrium in this system at temperatures above the critical temperature of argon (150.86K). Additionally, the three phase boundary solid-liquid-gas (solid-fluid-fluid) has been determined at pressures to 4000 atm. (Author)
AD-713 540 HC$3.00 MF$0.65

GASEOUS ILLUMINANT PYROTECHNIC SYSTEMS,
Picatinny Arsenal Dover N J Pyrotechnics Lab
For primary bibliographic entry see Field 19A.
AD-713 550 HC$3.00 MF$0.65

A NEW SENSITIVE METHOD FOR THE DETECTION AND QUANTITATIVE ANALYSIS OF AMMONIA AND ALIPHATIC AMINES,
Edgewood Arsenal Md
For primary bibliographic entry see Field 7C.
AD-713 556 HC$3.00 MF$0.65

THE PREPARATION AND PROPERTIES OF NEW OXIDIZERS FOR PROPELLANTS, NH4C104-KC104 and NH4C104-NH4NO3 MIXED CRYSTALS,
Picatinny Arsenal Dover N J
For primary bibliographic entry see Field 19A.
AD-713 564 HC$3.00 MF$0.65

THE DETERMINATION OF ALUMINUM AND CHLORINE IN COMPOSITE PROPELLANTS BY NON-DESTRUCTIVE ACTIVATION ANALYSIS USING A MIXTURE OF 14/5 MEV AND SLOW NEUTRONS.
White Sands Missile Range N Mex
For primary bibliographic entry see Field 21I.
AD-713 575 HC$3.00 MF$0.65

CHEMILUMINESCENT ORGANIC PHOSPHIDES,
Frankford Arsenal Philadelphia Pa Pitman-Dunn Research Labs
For primary bibliographic entry see Field 7C.
AD-713 580 HC$3.00 MF$0.65

DETAILED STUDY OF CONTAMINANT PRODUCTION IN A SPACE CABIN SIMULATOR AT 258 MM. MERCURY,
School of Aerospace Medicine Brooks AFB Tex
For primary bibliographic entry see Field 6K.
AD-713 613

CHEMICAL REACTIONS IN FROZEN SOLUTIONS.
Final rept. 1 Mar 66-30 Jun 70,
British Columbia Univ Vancouver Dept of Chemistry
Richard E. Pincock, Min-Min Tong, Wen Shu Lin, William Bruce Scott, and B. C. Menon. 30 Jun 70, 7p AFOSR-70-2228TR
Grant AF-AFOSR-1102-66

Descriptors: (*Solids, *Chemical reactions), Scientific research, Organic solvents, Ice, Reaction kinetics, Canada.
Identifiers: Matrix isolation techniques.

A very brief summary is presented on a research effort to investigate the kinetics of some bimolecular reactions in frozen solutions.
AD-713 623 HC$3.00 MF$0.65

EVALUATION OF MOLECULAR WEIGHT FROM EQUILIBRIUM SEDIMENTATION. PART IV: APPLICATION OF TIKHONOV'S REGULARIZING FUNCTIONS.
Summary rept. Jan 69-Feb 70,
Air Force Materials Lab Wright-Patterson AFB Ohio
Matatiahu T. Gehatia, and Donald R. Wiff. Aug 70, 47p Rept no. AFML-TR-67-121-Pt-4
See also Part 3, AD-709 885. Errata sheet inserted.

Descriptors: (*Molecular weight, Determination), Sedimentation, Chemical equilibrium, Computer programs, Mathematical analysis, Distribution functions.

Determination of a molecular weight distribution (MWD) from equilibrium sedimentation was investigated. Such a determination requires a solution of the Fujita equations, which proved to be a mathematically Improperly Posed Problem in Hadamard sense. To avoid these difficulties an approximate computational technique was applied which is based on variational calculus widened to include Tikhonov's regularizing functions. It was shown that this is an excellent method for determining a monomodal distribution. Also, the determination of a bi-modal distribution provided satisfactory results. However, a multi-modal distribution (fine structure in a MWD) requires the application of an additional algorithm. (Author)
AD-713 632 HC$3.00 MF$0.65

ZUM PROBLEM DER UEBERGANGSENTROPIE BEI DER DISSOZIATION (The Problem of Entropy Gain with Dissociation),
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Stuttgart-Vaihingen (West Germany)
L. Krauss. 30 Jan 70, 8p Rept no. DFVLR-Sonderdruck-58
Text in German; attached summary in English.
Availability: Pub. in Zeitschrift fuer Naturforschung, v25a n5 p724-729 1970. No copies furnished.

Descriptors: (*Diatomic molecules, *Dissociation), Specific heat, Entropy, West Germany.

An investigation was made to determine if Trouton-Pictet's rule, valid for phase transitions, can be extended to dissociation processes for diatomic molecules. Comparing the entropy increase from the non-dissociated to dissociated states, a common law exists for all diatomic molecules examined. If the procedure is performed at a certain 'fix-point', the maximum of the specific heats, an average value of approximately 30 cal/Mol K for entropy gain results. Since the Trouton-Pictet rule is a consequence of the theorem of corresponding states and has been found only for phase transitions, the above results lead to the assumption that the new law can be seen as an extention of the Trouton-Pictet rule applicable to all types of 'state transitions'. (Author)
AD-713 643

FAR INFRARED SPECTRA OF CRYSTALS AND SOLIDS IN A LARGE RANGE OF TEMPERATURES.
Final scientific rept. 1 May 66-31 Jan 70,
Centre National de La Recherche Scientifique Paris (France)
Joan Lecomte, and Armand Hadni. 28 Feb 70, 17p AFCRL-70-0426
Contract AF 61 (052)-957
See also AD-636 614.

Descriptors: (*Spectra (Infrared), Solids), (*Crystals, Spectra (Infrared)), Crystal structure, Halides, Oxides, Selenides, Tellurides, Silicon dioxide, Doping, Transition elements, Rare earth compounds, France.
Identifiers: *Far infrared spectroscopy, Alkali halides.

Far infrared spectra of crystals and solids in a large range of temperatures have been studied from 20 to 700 micrometers: pure single crystals mainly of high symmetry (potassium bromide, potassium iodide, thallium halides, cesium halides, silver halides; magnesium oxide, iron oxide, manganese oxide; zinc selenide, zinc telluride, cadmium selenide, copper chloride, quartz and potassium bichromate; silicium dioxide polymorphs, binary glasses); doped single crystals (KBr:Cl, KBr:Na, KI:Na, KI:Cl, KC1:Na, KCl:I, NaI:Cl); molecular crystals either inorganic or organic; hydrogen bonded crystals; rare earth and transition metals salts; clathrates of hydroquinone with HC; and H2S. (Author)
AD-713 677 HC$3.00 MF$0.65

BULLETIN OF THE RADIO AND ELECTRICAL ENGINEERING DIVISION OF THE NATIONAL RESEARCH COUNCIL OF CANADA. VOLUME 20, NUMBER 2, APRIL-JUNE 1970.
National Research Council of Canada Ottawa (Ontario) Radio and Electrical Engineering Div
For primary bibliographic entry see Field 9C.
AD-713 683

INFRARED SPECTRA OF AMINO ACIDS AND SIMPLE POLYPEPTIDES.
Monsanto Research Corp Dayton Ohio Dayton Lab
For primary bibliographic entry see Field 7C.
AD-713 689 HC$3.00 MF$0.65

GENERAL ALLOY ANALYSIS WITH A GAS SHEATHED TUBULAR ELECTRODE ARC.
Air Force Materials Lab Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 11H.
AD-713 690 HC$3.00 MF$0.65

PREPARATION AND HANDLING OF SODIUM SOLUTIONS IN HEXAMETHYL PHOSPHORIC TRIAMIDE FOR THERMIONIC AND PHOTOELECTRON EMISSION STUDIES.
Technical rept.,
New York Univ Bronx Dept of Chemistry
B. Baron, P. Delahay, and R. Lugo. Sep 70, 13p Rept no. TR-13
Contract Nonr-285 (65)
Supplement to Technical rept. no. 12, AD-707 534.

Descriptors: (*Thermionic emission, Electrons), (*Organic solvents, *Electrons), Solutions, Organic phosphorus compounds, Sodium, Laboratory equipment, Amides.
Identifiers: *Solvated electrons, *Phosphoric triamide/hexamethyl.

The report is described in minute detail the preparation and handling of solutions of sodium in hexamethyl phosphoric triamide (HMPA) used in the study of thermionic and photoelectron emission by solvated electron solutions. This material, which will not be published, is intended for workers in the field. It was our experience that work with these solutions requires attention to many practical details, even seemingly unimportant, if stable solutions are to be obtained and kept in apparatus. (Author)
AD-713 708 HC$3.00 MF$0.65

PHASE EQUILIBRIA INVESTIGATION OF BINARY, TERNARY, AND HIGHER ORDER SYSTEMS. PART IX. CALCULATION OF THERMODYNAMIC QUANTITIES FROM PHASE DIAGRAMS.
Technical rept. Apr 67-May 69,
Aerojet-General Corp Sacramento Calif Materials Research Lab
Erwin Rudy. Aug 70, 51p AFML-TR-69-117-Pt-9
Contract F33615-67-C-1513
See also Part 8, AD-708 476.

Descriptors: (*Phase studies, *Thermodynamics), Free energy, Phase diagrams, Reviews, Stability.

The thermodynamic fundamentals relating phase equilibria in binary and ternary systems to the thermodynamic properties of the phases are reviewed and discussed. Considered in detail are partition equilibria in ternary systems and the role of the three-phase equilibrium in the determination of the relative stabilities of stable as well as hypothetical phases. Sample calculations carried out on selected ternary metal-carbon and a metal silicate system demonstrate the application of the equations for extracting thermodynamic data from phase diagrams and also for the prediction of phase equilibria. (Author)
AD-713 712 HC$3.00 MF$0.65

ON THE INVERSE ISOTOPE EFFECT IN DISSOCIATIVE ATTACHMENT OF ELECTRONS IN METHANE.
Internal memo.,
General Research Corp Santa Barbara Calif
T. F. O'Malley. Jun 67, 5p Rept no. GRC-IMR-634
Contract DAAH01-67-C-1334, ARPA Order-958-67

Descriptors: (*Methane, *Exchange reactions), Dissociation, Deuterated compounds.
Identifiers: *Isotope exchange, Collision cross sections.

Observations of dissociative attachment of electrons to methane (CH4) and deuterated methane (CD4) were previously reported. The cross section for the formation of H (-), CH2 (-), and the corresponding deuterated species were reported. The present report points out that the so-called inverse isotope effect is simply the m to the 1/4th dependence.
AD-713 714 HC$3.00 MF$0.65

THE VAPOR PRESSURE OF BARIUM.
Technical information series,
General Electric Co Philadelphia Pa Missile and Space Div
P. D. Zavitsanos. 25 Nov 68, 18p Rept no. 68SD331
Contract AF 04 (694)-222

Descriptors: (*Barium, *Vaporization), (*Heat of vaporization, Barium), Mass spectroscopy.
Identifiers: Knudsen flow.

The vapor pressure and the heat of vaporization of barium were measured using the Knudsen target technique. A recording microbalance was used to measure both the effusion rate and the recoil force exerted by the beam onto the target. The measured vapor pressure may be presented by log P (atm) = 5.145 - 9597/T. Mass spectrometric investigation was conducted with the time-of-flight mass spectrometer which produced a second-law heat of vaporization. (Author)
AD-713 715 HC$3.00 MF$0.65

THE PROPERTIES OF WATER IN CAPILLARY SYSTEMS.
Technical rept.,
Hydronautics Inc Laurel Md
Moshe A. Frommer, Mordechai Shporer, Esther Loebel, and Rene Bloch. Sep 70, 38p Rept no. TR-7001-1
Contract N00014-70-C-0018

Descriptors: (*Cellulose acetates, *Membranes), (*Water, *Adsorption), Nuclear magnetic resonance, Relaxation time, Polymers, Surface properties, Magnetic properties.
Identifiers: Surface chemistry.

The properties of water adsorbed on various membranes prepared from cellulose acetate (C.A.) and from cellulose triacetate (C.T.A.) were investigated. Adsorption isotherms, nmr spectra and preliminary longitudinal and transversal nmr relaxation times (T (1) and T (2)) of the water in the membranes were determined. It was found: (1) The amounts of water sorbed in C.A. membranes at relative humidities lower than 0.6 depend primarily on the weight of the polymer and are practically insensitive to its structure (powder, extruded film, or cast membrane). (2) The amounts of water adsorbed in C.A. membranes at relative humidities higher than 0.7 are primarily determined by the porosity of the substrate. (3) Due to magnetic susceptibility, the position of the proton resonance peak of water in sheet membranes depends on the geometry of the sample with respect to the external magnetic field. This geometrical effect can be avoided by crushing the sheet membrane into fine platelets. (4) Both T (1) and T (2) of water in C.A. and in C.T.A. membranes increase with the amount of water in the membrane. (5) Even though the water molecules seem to be highly mobilized, the fact that T (1) > T (2) indicates a surface effect on the water. (Author)
AD-713 731 HC$3.00 MF$0.65

POLYMERIZATION-INDUCED ELECTRICAL EFFECTS IN SULFUR. THE ELECTRICAL RESISTANCE OF SULFUR AS A FUNCTION OF TEMPERATURE,
Army Electronics Command Fort Monmouth N J Inst for Exploratory Research
Gary C. Vezzoli. 14 Oct 69, 2p
Availability: Pub. in Jnl. of Polymer Science: ptAl (Notes) v8 p1587-1588 1970.

Descriptors: (*Sulfur, *Melting), Electrical properties, Polymerization, Resistance (Electrical).

Sulfur was heated at atmospheric pressure in a pyrophyllite container with tantalum electrodes

silver-soldered to platinum leads. Resistance was monitored as a function of temperature by the use of a calibrated vacuum tube voltmeter. Results indicate that resistance measurements are capable of clearly showing the effect of polymerization and depolymerization (polymer breakdown) in liquid sulfur. The results show that shortly after the inception of polymerization, known to occur at 159C, the resistance of sulfur rises. The experiment proves unequivocally that electrical resistance is very noticeably influenced by the reactions that take place in liquid sulfur.
AD-713 734

DYNAMIC POLARIZATION OF PHOSPHORUS NUCLEI BY NITROXIDE RADICALS,
Army Electronics Command Fort Monmouth N J Inst for Exploratory Research
Edward H. Poindexter, and Robert L. Glazer. 23 Feb 70, 4p
Availability: Pub. in Jnl. of the American Chemical Society, v92 n16 p4784-4786, 12 Aug 70.

Descriptors: (*Phosphines, *Nuclear magnetic resonance), Polarization, Free radicals, Solutions, Hyperfine structure.
Identifiers: *Nitroxides.

Dynamic nuclear polarization in six phosphorus compounds by four nitroxide radicals in liquid solution reveals several examples of stereospecific intermolecular hyperfine couplings. Trimethyl phosphate shows the expected weak scalar coupling with all four radicals. Di-t-butyl nitroxide and triacetone amine nitroxide fail to couple effectively with sterically unshielded phosphines and phosphites. These same two radicals show extremely strong coupling with dimethyl phosphite, suggesting a transient hydrogen bond P-H...O-N. (Author)
AD-713 736

HIGH RESOLUTION PHOTODETACHMENT OF S (-) NEAR THRESHOLD,
Joint Inst for Lab Astrophysics Boulder Colo
W. C. Lineberger, and Benjamin W. Woodward. 8 Jul 70, 4p
Contract DA-31-124-ARO (D)-139
Availability: Pub. in Physical Review Letters, v25 n7 p424-427, 17 Aug 70.

Descriptors: (*Sulfur, *Ionization), Ions, Photon bombardment, Atomic energy levels.

A tunable dye laser was used to measure the fine-structure splitting of the doublet P state of S (-) in a crossed-beam photodetachment experiment. These measurements verify photodetachment threshold laws and provide the most accurate experimental determination of any electron affinity. (Author)
AD-713 767

GLORY SCATTERING OF LITHIUM BY A SERIES OF MOLECULES. III. SPHERICAL-TOP MOLECULES,
General Dynamics/Convair San Diego Calif
Erhard W. Rothe, and Reinhard K. B. Helbing. 16 Feb 70, 7p AROD-6060:17-P
Grant AFOSR-1799-69
Prepared in cooperation with Wayne State Univ., Detroit, Mich. and California Univ., Los Angeles. See also AD-694 346.
Availability: Pub. in Jnl. of Chemical Physics, v53 n4 p1555-1559, 15 Aug 70.

Descriptors: (*Lithium, Scattering), Interactions, Quenching (Inhibition).
Identifiers: Scattering cross sections, *Atom molecule interactions, *Glory scattering.

The velocity dependence of the total cross section has been measured for the scattering of lithium-7 by 10 spherical-top molecules. The experiments were similar to those described in two previous papers in which the scattering was from 13 diatomics and from 29 polyatomics containing carbon, hydrogen, and fluorine. Potential parameters are derived. The quenching of the normal glory patterns is measured. Anisotropy parameters are obtained, using a 'clover-leaf' potential. (Author)
AD-713 782

DETERMINATION OF ALPHA-TOCOPHEROL IN FREEZE-DRIED FOODS BY A MODIFIED COLORIMETRIC PROCEDURE.
Final rept. 1 Oct 69-30 Apr 70,
School of Aerospace Medicine Brooks AFB Tex
Emmett J. Stork, and Ramiro P. Villanueva. Sep 70, 14p Rept no. SAM-TR-70-61

Descriptors: (*Vitamin E, *Colorimetric analysis), (*Dehydrated foods, Vitamin E), Food, Chemical analysis, Nutrition, Chromatographic analysis.
Identifiers: Emmerie Engel colorimetric analysis, *Tocopherol, *Freeze dried foods.

A reliably precise and reproducible determination of alpha-tocopherol was achieved by an adaptation of the classic colorimetric determination of alpha-tocopherol by Emmerie and Engel. The method was preceded by the separation of the various tocopherols either by secondary magnesium phosphate column chromatography (as described by Bro-Rasmussen and Hjarde, and Freed) or by Florisil column chromatography according to the method of Dicks-Bushnell. The basic Emmerie-Engel method, despite its disadvantages, is considered the most suitable method for use with oils, foods, and feeding stuffs. Samples of precooked, freeze-dried ground beef, chicken cubes, whole eggs, corn, beans, and peas were analyzed and alpha-tocopherol values consistent with those reported in the literature were obtained. Recovery values achieved with the addition of pure alpha-tocopherol ranged from a minimum recovery of 90.2% to a maximum recovery of 99.1%. (Author)
AD-713 829 HC$3.00 MF$0.65

PHYSICAL PROPERTIES OF THE CHOLESTERIC MESOPHASE.
Interim rept. no. 1, 10 May 65-10 May 66,
Kent State Univ., Ohio. Liquid Crystal Inst.
Glenn H. Brown. 15 Jun 66, 32p LCI-1
Contract DA-44-009-AMC-1074 (T)
See also Interim rept. no. 2, AD-822 208. Distribution Limitation now Removed.

Descriptors: (*Crystals, Liquids), (*Cholesteryl esters, Crystal structure), Light transmission, Colors, X-ray diffraction analysis, Spectra (Infrared), Absorption spectrum, Electric fields, Benzenes, Polycyclic compounds, Nitriles, Amines, Synthesis (Chemistry), Carbonates.
Identifiers: *Liquid crystals, Benzonitrile/(methoxybenzylidene)amino, Domains.

X-ray studies were initiated on the cholestric structure and on the solid forms of the red, green and blue colors of cholesteric esters which were prepared by quick freezing the cholesteric structure. Instrumentation for X-ray studies were designed and constructed. Infrared dichroism measurements were conducted by applying, in one series of studies, an electric field perpendicular to the direction of the propagation of the polarized radiation and in the second series parallel to the direction of propagation of the polarized radiation. An expression was derived that defined the dependence of the dichroic ratio on the magnitude of the applied field using a model of the molecular domain acting as a rigid dipole. The maximum degree of orientation of the nematic structure of p-methoxybenzylidene-p-cyanoaniline was found to be 0.33 at 106C. (Author)
AD-801 061 HC$3.00 MF$0.65

THEORY OF CARBON FORMATION IN VAPOR-PHASE PYROLYSIS. VOLUME I. CONSTANT CONCENTRATION OF ACTIVE SPECIES.
Aerospace Corp., El Segundo, Calif. Labs. Div.
For primary bibliographic entry see Field 11B.
AD-815 672 HC$3.00 MF$0.65

PHYSICAL PROPERTIES OF THE CHOLESTERIC MESOPHASE.
Interim rept. no. 2, 10 May 66-10 May 67,
Kent State Univ., Ohio. Liquid Crystal Inst.
Glenn H. Brown. 15 Jun 67, 66p LCI-2
Contract DA-44-009-AMC-1074 (T)
See also Interim rept. no. 1, AD-801 061 and Interim rept. no. 3, AD-848 719. Distribution Limitation now Removed.

Descriptors: (*Cholesteryl esters, Synthesis (Chemistry)), (*Crystals, Liquids), X-ray diffraction analysis, Transition temperature, Physical properties, Phase studies, Benzoates, Imines.
Identifiers: *Liquid crystals, Cholesteric phase, Nematic phase.

The report outlines the synthesis of several series of cholesteric liquid crystalline compounds as well as some nematic compounds whose structures lend valuable insight into the structure of cholesteric liquid crystals. One hundred twenty cholesteric compounds are reported of which approximately 80% have not been reported previously. The transition temperatures for the compounds are reported (determined by the use of a Hoover-Thomas apparatus); these temperatures are being refined by the use of differential thermal analysis equipment. The cholesteric compounds reported are derivatives of cholesteryl 4-substituted benzoates, of cholesteryl 4-alkoxybenzoates, of cholesteryl 3-chloro-4-alkoxybenzoates, of methyl 3beta- (substituted benzyloxy)-Delta 5-cholenates, of cholestanyl benzoates, of 6-ketocholestanyl benzoates, of 7-dehydrocholesteryl benzoates, of ergosteryl benzoates, of pregnenolone benzoates, of campesteryl benzoates, of stigmasteryl benzoates, of cholesteryl disubstituted benzoates, and of cholesteryl cinnamates. The nematic compounds reported are terephthal-bis-amino derivatives, terephthal-bis-aniline and bis-aminopyridine derivatives. In addition to reporting the transition temperatures on the cholesteric and nematic liquid crystalline compounds, observations concerning the relationship between the transition temperatures and the character of the substituents in the molecule are included. (Author)
AD-822 208 HC$3.00 MF$0.65

PHYSICAL PROPERTIES OF THE CHOLESTERIC MESOPHASE.
Interim rept. no. 3, 10 May 67-10 May 68,
Kent State Univ., Ohio. Liquid Crystal Inst.
Glenn H. Brown. 26 Jun 68, 44p LCI-3
Contract DA-44-009-AMC-1074 (T)
See also Interim rept. no. 2, AD-822 208 and Final rept., AD-872 377. Distribution Limitation now Removed.

Descriptors: (*Cholesteryl esters, *Ultrasonic properties), (*Crystals, Liquids), X-ray diffraction analysis, Reflection, Benzoates, Mechanical waves, Programming (Computers).
Identifiers: *Liquid crystals, *Nananoic acid/(cholesteryl-ester).

The report outlines research on the properties of ultrasonic waves (11 MHz, 14.5 MHz and 30 MHz) in a cholesteric liquid crystal. The method involves the measurement of the complex reflection coefficient that occurs when a transverse mechanical wave reflects from the boundary of a fused quartz substrate and a liquid crystal. Another measurement involves phase-coherent detection as a means of measuring phase-shift using ultrasonic shear waves. The reflection coefficient is quite sensitive to the liquid crystalline state. There is a large change in the reflection coefficient (r) at the nematic-isotropic point but its dependence on temperature is not always the same at different frequencies. At some frequencies plots of r as a function of temperature show an increase in r as the temperature rises while at other frequencies r decreases. Phase-shift measurements in cholesteryl nonanoate show only a few degrees shift

which is characteristic of most liquids. Values for skin depth and velocity of ultrasonic waves in cholesteryl nonanoate were established. (Author)
AD-848 719 HC$3.00 MF$0.65

PHYSICAL PROPERTIES OF THE CHOLESTERIC MESOPHASE.
Final rept.,
Kent State Univ., Ohio. Liquid Crystal Inst.
Glenn H. Brown. 11 May 70, 96p LCI-4
Contract DA-44-009-AMC-1074 (T)
See also Interim rept. no. 3, AD-848 719. Distribution Limitation now Removed.

Descriptors: (*Crystals, Liquids), (*Cholesteryl esters, *Ultrasonic properties), Imines, Dipole moments, Surfaces, Transition temperature, Molecular structure, Phase studies, Esters, Infrared spectroscopy.
Identifiers: *Liquid crystals, *Nonanoic acid/(cholesteryl-ester), *Cinnamic acid/ (ethyl-ester)-(methoxybenzylidene)amino, Nematic phase.

The final report describes experimental research on the behavior of ultrasound in liquid crystals, structure studies of liquid crystals by use of x-ray methods, degree of ordering in a nematic liquid crystal under an electric field, and synthesis of new liquid crystalline compounds. From the theoretical point of view the application of a dipole-dipole model to liquid crystalline systems is presented. For cholesteryl nonanoate the skin-depth penetration of the shear wave was found to be 0.000002M with a wave velocity of 80 M/sec at a frequency of 9.45 MH. The small penetration depth makes the shear-wave technique ideally suited for studying surface properties of liquid crystals. Some liquid crystals take on an ordered arrangement on surfaces while others are unordered. The dipole-dipole model of a nematic liquid crystal predicts an antiferroelectric state of order based on dipole-dipole interactions of nearest neighbors. The model also predicts that the nematic-isotropic point should be field dependent. X-ray studies have led to the point where it can give a fairly good classification of liquid crystals based on diffraction patterns. Infrared dichroic studies can be used to establish the degree of ordering of nematic liquids. (Author)
AD-872 377 HC$3.00 MF$0.65

HARTREE-FOCK WAVE FUNCTIONS AND COMPUTED ONE-ELECTRON PROPERTIES FOR OXYGEN MONOFLUORIDE (OF, doublet Pi) AT SIX INTERNUCLEAR SEPARATIONS,
Argonne National Lab., Ill.
P. A. G. O'Hare, and Arnold C. Wahl. Jun 70, 12p
Contract W-31-109-eng-38

Descriptors: (*Oxygen fluorides, *Molecular orbitals), Wave functions, Hartree-Fock approximation.
Identifiers: *Quantum chemistry.

For abstract, see NSA 24 20.
ANL-7702 HC$3.00 MF$0.65

THEORY OF HYPERFINE ESR LINE-WIDTH IN A LINEAR CHAIN. Cu (NH3)4SO4.H2O,
Kansas Univ., Lawrence.
Carl D. McElwee. 30 Jun 70, 30p
Contract AT (11-1)-1488

Descriptors: (*Copper compounds, *Electron spin resonance), Sulfates, Ammino compounds, Hyperfine structure, Complex compounds.

For abstract, see NSA 24 20.
COO-1488-19 HC$3.00 MF$0.65

HIGH TEMPERATURE SATURATED PHASE DENSITIES AND THE CRITICAL DENSITY AND TEMPERATURE OF CESIUM,
Columbia Univ., New York. Liquid Metals Research Lab.
George F. Oster, and Charles F. Bonilla. 1970, 7p
CU-2660-43 CONF-700901-1
Presented at the Symposium on Thermophysical Properties, (5th), American Society of Mechanical Engineers, Boston, Mass. 30 Sep-2 Oct 70.

Descriptors: (*Liquid metals, *Phase transformations), (*Cesium, Phase transformations), Critical temperature, Critical density.

For abstract, see NSA 24 20.
CU-2660-56 HC$3.00 MF$0.65

EXPERIMENTS ON PRECONCENTRATION OF IMPURITIES IN HELIUM GAS BY THERMAL DIFFUSION AND THE MEASURING OF THERMAL DIFFUSION FACTORS. PROJECT DRAGON,
Atomic Energy Establishment, Winfrith (England).
For primary bibliographic entry see Field 18I.
For abstract, see NSA 24 20.
DP-Report-392 HC$3.00 MF$0.65

INTERNATIONAL ATOMIC ENERGY AGENCY, INTERNATIONAL WORKING GROUP ON FAST REACTORS MEETING OF SPECIALISTS ON SODIUM-WATER REACTIONS, ARGONNE, USA, 5-6 NOVEMBER 1968.
Argonne National Lab., Ill.
For primary bibliographic entry see Field 18J.
For abstract, see NSA 24 20.
IAEA/NPR-9 HC$3.00 MF$0.65

BIBLIOGRAPHY OF MASS SPECTROSCOPY LITERATURE FOR THE FIRST HALF OF 1968, COMPILED BY A COMPUTER METHOD,
Ames Lab., Iowa.
J. Capellen, H. J. Svec, J. R. Jordan, and R. Sun.
Aug 70, 463p*
Contract W-7405-eng-82

Descriptors: (*Mass spectroscopy, . *Bibliographies).

For abstract, see NSA 24 20.
IS-2059 HC$3.00 MF$0.65

STUDIES IN ELECTROCHEMISTRY,
Joint Publications Research Service, Washington, D.C.
E. G. Bondarenko, A. P. Tomiliv, and I. M. Osadchenko. 20 Oct 70, 9p
Trans of Vsesoyuznoe Khimicheskoe Obshchestvo. Zhuranl (USSR) v15 n4 p466-467, 470-471 1970.

Descriptors: (*Glycols, *Oxidation), (*Hydrides, *Reduction (Chemistry)), Electrochemistry, Group 4A compounds, Group 5A compounds, Group 6A compounds, Aromatic polycyclic hydrocarbons, USSR, Translations.
Identifiers: Bicyclo (4-3-1) decatriene diols.

Contents: Oxidation of n-xylyleneglycol on a rotating disk electrode; and Certain regularities in a series of volatile inorganic hydrides.
JPRS-51604 HC$3.00 MF$0.65

THE FORMATION OF A SOLID SOLUTION OF LITHIUM FLOURIDE AND LITHIUM HYDRIDE,
Los Alamos Scientific Lab., N. Mex.
H. Hahn, and G. Strick. 1970, 4p
Trans. of Zeitschrift fuer Anorganische und Allgemeine Chemie (East Germany) v372 p 248 1970.

Descriptors: (*Lithium fluorides, Solid solutions), (*Lithium hydride, Solid solutions), Crystal lattices, East Germany, Translations.

For abstract, see NSA 24 20.
LA-tr-70-16 HC$3.00 MF$0.65

VIBRATIONAL ANISOTROPY AND GOL'DANSKII-KARYAGIN EFFECT IN TRIMETHYLTIN CYANIDE,
Rutgers - The State Univ., New Brunswick, N.J. School of Chemistry.
Rolfe H. Herber, Subhas Chandra, and Yehonathan Hazony. 1969, 25p NYO2807-78
Prepared in cooperation with Princeton Univ., N.J. Dept. of Chemical Engineering.

Descriptors: (*Tin organic compounds, *Mossbauer effect), Anisotropy, X ray diffraction analysis, Nitriles.
Identifiers: *Stannane carbonitrile/trimethyl.

For abstract, see NSA 24 20.
NYO-2472-68 HC$3.00 MF$0.65

ON THE QUESTION OF EXISTENCE OF INTRAMOLECULAR ENDOCYCLIC NUCLEOPHILE SUBSTITUTION REACTIONS ON TETRAHEDRAL CARBON.
Zur Frage Der Existenz Intramolekularer Endocylischer Sn-reaktioven Am Tetrahedralen Kohlenstoff
Eidgenossische Technische Hochschule, Zurich (Switzerland).
L. Tenud. 1969, 108p DISS-NR-4331
Lang- in German

Descriptors: *Carbon compounds, *Electron attachment, *Intramolecular structures, *Reaction kinetics, Chemical reactions, Substitutes, Tetrahedrons.

For abstract, see STAR 08 21.
N70-37784 HC$3.00 MF$0.65

TURBIDIMETRIC DETERMINATION OF SULFITE ION IN INHIBITED ETHYLENE GLYCOL-WATER SOLUTIONS.
National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
G. L. Baughman, H. D. Bullard, and L. D. Underhill. 18 Sep 70, 17p NASA-TM-X-65135, KSC-TR-1073

Descriptors: *Glycols, *Iodimetry, *Sulfites, *Turbidity, Thiols.

For abstract, see STAR 08 21.
N70-38191 HC$3.00 MF$0.65

THERMODYNAMIC AND KINETIC STUDIES ON MIXED COMPOUNDS OF RARE EARTHS.
Thermodynamische Und Kinetische Untersuchungen Von Mischkomplexen Der Seltenen Erden
Eidgenossische Technische Hochschule, Zurich (Switzerland).
U. Karlen. 1969, 102p DISS-4351
Lang- in German

Descriptors: *Lanthanum compounds, *Rare earth compounds, *Reaction kinetics, *Thermodynamic properties, Chelates, Chemical equilibrium, Organometallic compounds.

For abstract, see STAR 08 21.
N70-38311 HC$3.00 MF$0.65

A NEW VERSION OF THE EPOXY KETONE TO ALKINON FRAGMENTATION - THERMAL DISSOCIATION OF HYDRAZONES FROM ALPHA, BETA-EPOXY CARBONYL COMPOUNDS AND N-AMINO AZIRIDINES.
Eine Neue Version Der Epoxyketon Zur Alkinon-Fragmentierung - Thermischer Zerfall Der Hydrazone Aus Alpha, Beta-epoxycarbonyl-Verbindungen Und N-amino-aziridinen
Eidgenossische Technische Hochschule, Zurich (Switzerland).
U. Horn. 1969, 95p DISS-4372
Lang- in German

Descriptors: *Epoxy compounds, *Hydrazonium compounds, *Thermal dissociation, Amino acids, Carbonyl compounds, Chemical reactions, Fragmentation.

For abstract, see STAR 08 21.
N70-38332 HC$3.00 MF$0.65

CHEMICAL AND VIBRATIONAL RELAXATION IN SUPERSONIC CARBON DIOXIDE FLOWS.
Khimicheskaia I Kolebatelnaia Relaksatsha V Sverkhzvukovykh Potokakh Dvuokisi Ugleroda
Techtran Corp., Glen Burnie, Md.
N. I. Yushchenkova. May 70, 15p NASA-TT-F-12922
Contract NASW-2037
Coll- 15 P Refs Tran- Transl. Into English From Zh. Prikl. Spektroskopii, Akad. Nauk Belorussk. Ssr (Minsk), V. 11, Sep. 1969 P 417-424

Descriptors: *Carbon dioxide, *Gas flow, *Molecular relaxation, *Supersonic flow, Differential equations, Energy transfer, Equations of state, High temperature, Kinetics, Numerical integration.

For abstract, see STAR 08 21.
N70-38468 HC$3.00 MF$0.65

ABSORPTION OF ETHYLENE OXIDE AND VINYL CHLORIDE ON AN IRON (011) SURFACE AND EFFECT OF THESE FILMS ON ADHESION.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
D. H. Buckley. Sep 70, 17p NASA-TN-D-5999, E-5724
Contract 129-03

Descriptors: *Adhesion, *Adsorption, *Chlorides, *Ethylene oxide, *Iron, *Surface layers, Auger effect, Electron diffraction, Vinyl radical.

For abstract, see STAR 08 21.
N70-38488 HC$3.00 MF$0.65

TRACE CONTAMINANT ADSORPTION AND SORBENT REGENERATION.
Lockheed Missiles and Space Co., Palo Alto, Calif.
For primary bibliographic entry see Field 6K.
For abstract, see STAR 08 21.
N70-38501 HC$3.00 MF$0.65

MODIFICATION OF THE EXTENDED HUECKEL THEORY. AB INITIO CALCULATIONS WITH MINIMUM BASE OF GAUSS A O-FUNCTIONS.
Modifikation Der Extended Hueckel Theorie Ab-initio-rechnungen Mit Minimaler Basis Von Gauss-ao-funktionen
Eidgenossische Technische Hochschule, Zurich (Switzerland).
H. F. Baumann. 1968, 74p DISS-4283
Lang- in German

Descriptors: *Gauss equation, *Hueckel theory, *Molecular orbitals, *Organic chemistry, Atomic excitations, Ionization, Quantum mechanics, Theoretical physics.

For abstract, see STAR 08 21.
N70-38585 HC$3.00 MF$0.65

CHEMICAL BONDING AND NEPHELAUXETIC EFFECT IN TRANSITION METAL COMPLEXES. DISCUSSION OF OPTICAL SPECTRA AND E R S-DATA OF COPPER II COMPLEXES IN SINGLE CRYSTALS.
Chemische Bindung Und 'nephelauxetischer Effekt' in Uebergangsmetallkomplexen. Diskussion Von Optischen Spektren Und Esr-Daten Von Cu (Ii)-komplexen in Einkristallen
Eidgenossische Technische Hochschule, Zurich (Switzerland).
J. Ammeter. 1969, 191p DISS-4338
Lang- in German

Descriptors: *Atomic structure, *Chemical bonds, *Copper compounds, *Organometallic compounds, Chelates, Electronic spectra, Single crystals.

For abstract, see STAR 08 21.
N70-38954 HC$3.00 MF$0.65

CONCENTRATION AND DESALTING OF PROTEIN SOLUTIONS PROGRAM.
Progress rept. 1 Sep-30 Nov 69,
Oak Ridge National Lab., Tenn.
C. W. Hancher, A. D. Ryon, and F. L. Rogers. Aug 70, 29p
Contract W-7405-eng-26

Descriptors: (*Proteins, *Concentrating), (*Desalting, Proteins), (*Membranes, *Filtration), Solutions, Solvent extraction.

For abstract, see NSA 24 20.
ORNL-TM-3001 HC$3.00 MF$0.65

ENERGY LOSSES, RANGE, AND BREMSSTRAHLUNG YIELD FOR 10 keV TO 100 MeV ELECTRONS IN SOME SIMPLE ELEMENTS AND SOME CHEMICAL COMPOUNDS,
Oak Ridge National Lab., Tenn.
Lucien Pages, Evelyne Bertel, Henri Joffre, and Laodamas Sklavenitis. Jul 70, 137p
Trans. from Centre d'Etudes Nuclearires, Saclay. Report (France) CEA-R-3942 1970.

Descriptors: (*Atoms, *Electron bombardment), (*Chemical compounds, Electron bombardment), Bremsstrahlung.

For abstract, see NSA 24 20.
ORNL-tr-2331 HC$3.00 MF$0.65

TERNARY OXIDES OF Np (IV) AND Am (III) WITH Mo OR W: NpM2O8, Am2M3O12 (M EQUALS Mo, W),
Oak Ridge National Lab., Tenn.
William Freundlich, and Monique Pages. 1970, 3p
Trans. of Academie des Sciences, Paris. Comptes Rendus (France) v269C p392-394, 4 Aug 69, by Martha W. Gerrard.

Descriptors: (*Molybdates, *Phase transformations), Americium compounds, Thorium inorganic compounds, Neptunium compounds, Crystal structure, France, Translations.
Identifiers: *Neptunium molybdates, *Thorium molybdates, *Americium molybdates.

For abstract, see NSA 24 20.
ORNL-tr-2363 HC$3.00 MF$0.65

CRYSTALLINE STRUCTURE OF HIGH TEMPERATURE SILVER IODIDE alpha-AgI,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 20B.
For abstract, see NSA 24 20.
ORNL-TR-2374 HC$3.00 MF$0.65

X-RAY DIFFRACTION DATA ON LIQUID TRIMETHYLAMINE DECAHYDRATE AT 5C,
Oak Ridge National Lab., Tenn.
R. W. Hendricks, A. H. Harten, and Cynthia Folzer. Aug 70, 36p
Contract W-7405-eng-26, Grant DI-14-01-0001-1274
Prepared in cooperation with Pittsburgh Univ., Dept. of Crystallography.

Descriptors: (*Amines, *Hydrates), X-ray diffraction analysis.
Identifiers: *Trimethylamines, *Clathrate compounds.

For abstract, see NSA 24 20.
ORNL-4571 HC$3.00 MF$0.65

SPC-12 MASS SPECTROMETER ROUTINES: REAL TIME DATA ACQUISITION AND DATA REDUCTION FOR BENDIX T-O-F INSTRUMENTS,
Florida Univ., Gainesville.
For primary bibliographic entry see Field 14B.
For abstract, see NSA 24 20.
ORO-3106-33 HC$3.00 MF$0.65

TWO-PHASE EQUILIBRIA OF ANALYTICAL BINARY SOLUTIONS NEAR THE CRITICAL POINT.
Information circular,
Bureau of Mines, Washington, D.C.
B. J. Dalton. Sep 70, 15p IC-8486

Descriptors: (*Critical point, *Equations of state), Free energy, Concentration (Composition), Pressure, Temperature, Thermodynamics, Binary systems (Materials).

Several relationships between coexisting phases for analytical binary solutions near the critical point are given. These relationships were developed from a consideration of a (G, u, P) surface at constant temperature and a (G, u, T) surface at constant pressure, where G is the molal Gibbs free energy, u is the concentration of component 1 expressed as a mole fraction, P is the pressure, and T is the temperature. These formulas should facilitate the calculation of some of the quantities useful in making thermodynamic consistency checks on phase equilibria data about the critical point. (Author)
PB-194 939 HC$3.00 MF$0.65

PREDICTION OF SODIUM CONCENTRATION IN LIGNITE.
Bureau of Mines, Washington, D.C.
For primary bibliographic entry see Field 21D.
PB-194 940 HC$3.00 MF$0.65

ANALYTICAL COORDINATION CHEMISTRY SECTION: SUMMARY OF ACTIVITIES JULY 1969 TO JUNE 1970.
Technical note,
National Bureau of Standards, Washington, D.C.
O. Menis, and J. I. Shultz. Sep 70, 154p NBS-TN-544
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $1.25 as C13.46:544.

Descriptors: (*Chemical analysis, *Standards), (*Coordination compounds, Chemical analysis), Spectroscopic analysis, Electromagnetic wave filters, Fluorescence, Xanthines, Rare earth compounds, Flame photometry, Atomic spectroscopy, Complex compounds, Quartz, Potassium nitrate, Thermogravimetry.
Identifiers: Rhodamine 6G, *Bilirubin, Cycloheptatrienone/isopropyl-2-hydroxy-2-4-6.

Contents: Solid materials and liquid filters to check the photometric scales of spectrophotometers; Spectrophotometric determination of trace amounts of gold, iron, manganese and nickel in two glass standard reference materials; Study of the rhodamine 6G fluorescence; Fluorescence and absorption of rare-earths in glasses; Multipurpose precision flame spectrophotometer; Long-path flames; Hollow cathode after Grimm; Spectrophotometric instrument for ratios and difference measurements, selection of the analytical line and non-absorbing line in atomic absorption; Oxidant-fuel mixtures regulation; Bilirubin complexation; Determination of formation constants of iron (III) and vanadium (V) with beta-isopropyltropolone; Kinetics and mechanism of extraction of iron (III) with beta-isopropyltropolone; The inert-gas fusion apparatus for the simultaneous determination of oxygen and nitrogen in metals; Evaluation of a special ingot iron for use as a stan-

dard reference material for oxygen content; The ASTM Committee E-1 Subcommittee round robin on thermal analytical substances; Standard Reference Material 755, quartz; Standard Reference Material 756, potassium nitrate; Thermal gravimetric analysis of bilirubin; Standard reference materials information and summary.
PB-194 960 HC$1.25 MF$0.65

CONTRIBUTIONS TO THE DATA ON THEORETICAL METALLURGY. XIII. HIGH-TEMPERATURE HEAT-CONTENT, HEAT-CAPACITY, AND ENTROPY DATA FOR THE ELEMENTS AND INORGANIC COMPOUNDS,
Bureau of Mines, Washington, D.C.
Kenneth Keith Kelley. 1960, 248p BM-Bull-584
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $1.25 as I28.3:584. See also report dated Sep 63, PB-194 130.

Descriptors: (*Inorganic compounds, *Thermodynamic properties), Tables (Data), Entropy, Specific heat, Halides, Hydrides, Nitrides, Oxides, Intermetallic compounds.

The publication contains high-temperature heat-content, heat-capacity, and entropy data for the elements and inorganic compounds. The available experimental and calculated values were compiled and intercompared, and a selection of 'best' values was made. The heat-content data was given in tabular form for use by those who make thermodynamic computations by means of tables, and in algebraic form for use by those who prefer equations. (Author)
PB-195 019 MF$0.65

AUTOMATED POTENTIOMETRIC TECHNIQUES FOR THE ON-SITE MONITORING OF IONS IMPORTANT IN WATER QUALITY CONTROL.
Completion rept. 1 Oct 70,
Missouri Univ., Columbia. Dept of Chemistry.
Stanley E. Manahan. 1970, 14p* W71-00474
Contract DI-14-31-0001-3025
See also Rept. no. PB-192 809.

Descriptors: (*Water pollution, *Monitors), (*Nitrates, Water pollution), (*Potentiometric analysis, Nitrates), Electrochemistry, Algae, Electrodes, Fluorides.
Identifiers: *Water pollution detection.

The characteristics of the nitrate electrode - fluoride electrode cell without liquid junction were investigated for applicability to nitrate ion analysis. In addition to enabling accurate nitrate analysis, the cell was found to be useful for examining the effects of interfering ions. An attempt was made to use the nitrate electrode in following nitrate ion uptake by algal cultures. The algae interfere to a certain extent with the electrode response. Using knowledge gained from research under this grant, a potentiometric nitrate analysis capability has been set up at the new University of Missouri Environmental Trace Substances Laboratory. (Author)
PB-195 167 HC$3.00 MF$0.65

IDEAL GAS THERMODYNAMIC FUNCTIONS AND ISOTOPE EXCHANGE FUNCTIONS FOR THE DIATOMIC HYDRIDES, DEUTERIDES, AND TRITIDES,
National Bureau of Standards, Washington, D.C.
Lester Haar, Abraham S. Friedman, and Charles W. Beckett. 29 May 61, 278p NBS-Mono-20

Descriptors: (*Hydrides, *Thermodynamic properties), (*Deuterium compounds, Thermodynamic properties), (*Tritium compounds, Thermodynamic properties), Isotope exchange, Diatomic molecules, Specific heat, Enthalpy, Free energy, Entropy.

The Monograph contains a consistent set of tables of thermodynamic properties of a large number of diatomic hydrides, deuterides, and tritides, for the ideal gas state at one atmosphere pressure. In addition to the thermodynamic properties of the molecular gases, the tables also include thermodynamic properties for chemical reactions involving the isotopic exchange of hydrogen. The thermodynamic properties tabulated are the heat capacity, enthalpy, Gibbs free energy, and entropy. (Author)
PB-195 221 HC$3.00 MF$0.65

A CORRELATION FOR THE PREDICTION OF INTERACTION ENERGY PARAMETERS FOR MIXTURES OF SMALL MOLECULES.
National Bureau of Standards, Boulder, Colo. Cryogenics Div.
M. J. Hiza, and A. G. Duncan. 27 Feb 69, 6p NBS-R-597
Revision of report dated 13 Dec 68. Pub. in AlChE Jnl, v16 n5 p733-738 Sep 70.

Descriptors: (*Phase transformations, *Liquefied gases), Ionization potential, Hydrogen, Helium, Neon, Equations of state.

Low temperature, phase-equilibria data for binary systems containing hydrogen, helium, and neon were used to develop a correlation relating deviations from the geometric mean combining rule for the characteristic energy parameter to the ionization potentials of the component species. With the exception of oxygen systems, this relatively simple relationship correctly predicts published deviations, determined by different methods, for a number of systems within expected uncertainties. It is shown that consideration of attractive forces only, as done by Hudson and McCoubrey, is inadequate for such predictions. (Author)
PB-195 252

PROPERTIES OF FLUORINE ALONG THE VAPOR-LIQUID COEXISTENCE BOUNDARY,
National Bureau of Standards, Boulder, Colo. Inst. for Basic Standards.
Rolf Prydz, G. C. Straty, and K. D. Timmerhaus. 11Mar 70, 5p NBS-R-595
Pub. in Jnl of Chemical Physics, v53 n6 p2359-2363, 15 Sep 70.

Descriptors: (*Fluorine, Thermodynamic properties), (*Liquefied gases, *Phase transformations), Critical point, Vapor pressure, Heat of vaporization.

Saturated liquid and vapor densities from the triple point to the critical points for fluorine are reported. These data were derived from experimental PVT isochores and an accurate vapor pressure equation. The critical point parameters were estimated by fitting an equation to all experimental data within 20% of the critical temperature. Separate equations, each constrained to the new critical point parameters, were fitted to the saturated liquid and vapor densities. Latent heats of vaporization were calculated from the Clapeyron equation and compared to other published values. A vapor pressure equation based on the IPTS 1968 temperature scale is reported. (Author)
PB-195 254

PRELIMINARY DEVELOPMENT OF A COOPERATIVE INTERNATIONAL COMPUTER-BASED CHEMICAL INFORMATION NETWORK.
Chemical Abstracts Service, Columbus, Ohio.
For primary bibliographic entry see Field 5B.
PB-195 259 HC$3.00 MF$0.65

STUDIES OF THE SUPEROXIDE ION AND OTHER SOLUTE SPECIES IN MOLTEN FLUORIDES.
Doctoral thesis,
Oak Ridge National Lab., Tenn.
Fred L. Whiting. Aug 70, 79p

Descriptors: (*Fused salts, *Ions), (*Fluorides, Fused salts), Oxides, Electrochemistry, Theses.

For abstract, see NSA 24 20.
TID-25480 HC$3.00 MF$0.65

QUANTITATIVE ANALYSIS BY DIFFUSION INTO A GEL WITH A PRECIPITANT (Kolichestvennyi Analiz Putem Diffuzii Opredelyaemogo Veshchestva v Gel s Osaditelem),
National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.
A. A. Lurie. 1970, 15p SFCSI-Comm (TT-70-57071), DMDC-4471
Trans. of Zhurnal Analiticheskoi Khimii (USSR) v22 n5 p 689-693 1967.

Descriptors: (*Metals, Chromatographic analysis), (*Precipitation (Chemistry), *Chromatographic analysis), Quantitative analysis, Diffusion, Gels, USSR, Translations.
Identifiers: Gel permeation chromatography.

Diffusion precipitation chromatography is based on the precipitation of components of a solution during diffusion into a gel (or any other porous material saturated with moisture) containing a precipitant. The common concepts of the theory of chromatography are often not applicable in this case. Diffusion precipitation chromatographys is used as a method of analysis. Attempts have been made to use this method for semiquantitative analysis. The present study is aimed at showing the possibility of sufficiently fine quantitative determinations by the given method. (Author)
TT-70-57071 HC$3.00 MF$0.65

THERMODIFFUSION OF CESIUM VAPORS IN HELIUM (Termicheskaya Diffuziya Parov Tseziya v Gelii),
National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.
K. M. Arefev, I. I. Paleev, V. M. Borishanskii, B. M. Khomchenkov, and N. I. Ivashchenko. 1970, 16p SFCSI-Comm (TT-70-57072), DMDC-4628
Trans. of Inzhenerno-Fizicheskii Zhurnal (USSR) v11 n6 p765-772 1966.

Descriptors: (*Cesium, *Thermal diffusion), (*Metal vapors, *Diffusion), Helium, Kinetic theory, Heat transfer, USSR, Translations.

The thermodiffusion of cesium vapors in helium was studied. Diffusion coefficients and thermodiffusion ratio have been calculated. Thermodiffusion flow in the case of condensation of cesium from a mixture with helium was studied. (Author)
TT-70-57072 HC$3.00 MF$0.65

HIGH-PRESSURE RAMAN SPECTRA OF HEXAGONAL ZINC SULFIDE,
California Univ., Los Angeles. Dept. of Chemistry.
Y. Ebisuzaki, and M. Nicol. 1969, 9p CONF-700329-1
Contract AT (11-1)-34
Presented at the Meeting of the American Physical Society, Dallas, Tex. Mar 70.

Descriptors: (*Zinc sulfides, *Rama spectra), High pressure tests.

For abstract, see NSA 24 20.
UCLA-34-P-88-28 (Rev.) HC$3.00 MF$0.65

EIGHTH PROGRESS REPORT ON SOLID-STATE AND MOLECULAR PHYSICS.
California Univ., Los Angeles.
1 Apr 70, 33p
Contract AT (11-1)-34

Descriptors: (*Electron transitions, *Crystal lattices), (*Raman spectroscopy, Research), High pressure tests, Infrared spectroscopy.

For abstract, see NSA 24 20.
UCLA-34-P-88-30 HC$3.00 MF$0.65

VAPORIZATION KINETICS OF ZINC OXIDE AND CADMIUM SULFIDE SINGLE CRYSTALS.
Thesis,
California Univ., Berkeley. Lawrence Radiation Lab.
Ralph Beaumont Leonard. May 70, 130p
Contract W-7405-eng-48

Descriptors: (*Cadmium sulfides, *Vaporization), (*Zinc oxides, Vaporization), Kinetics, Crystal structure.

For abstract, see NSA 24 20.
UCRL-19187 HC$3.00 MF$0.65

ELECTRON IMPACT EXCITATION EFFICIENCY CURVES FOR THE FORMATION OF NEUTRAL METASTABLE SPECIES,
California Univ., Berkeley. Lawrence Radiation Lab.
Amos S. Newton, and G. E. Thomas. Jun 70, 3p
CONF-700607-2
Contract W-7405-eng-48
Presented at the Annual Conference on Mass Spectrometry and Allied Topics (18th), San Francisco, Calif. Jun 70.

Descriptors: (*Molecular beams, *Electron bombardment), Mass spectroscopy, Atomic beams.

For abstract, see NSA 24 20.
UCRL-19594 HC$3.00 MF$0.65

AN AUTOMATED, HIGH-SENSITIVITY. THREE-COLUMN GAS CHROMATOGRAPH,
California Univ., Livermore. Lawrence Radiation Lab.
For primary bibliographic entry see Field 14B.
For abstract, see NSA 24 20.
UCRL-50849 HC$3.00 MF$0.65

7E. Radio and Radiation Chemistry

THE NATURE OF THE REACTIVE EXCITED STATES IN THE PHOTOCHEMICAL BUCHI REARRANGEMENT OF BICYCLO (3.2.0)HEX-6-EN-2-ONES,
New York Univ Bronx Dept of Chemistry
David I. Schuster, and David H. Sussman. 15 Jan 70, 7p AROD-4019:29-C
Grant DA-ARO (D)-31-124-G901
Availability: Pub. in Tetrahedron Letters, n19 p1661-1664 1970.

Descriptors: (*Ketones, *Photochemistry), Alkenes, Polycyclic compounds, Molecular energy levels.
Identifiers: *Bicyclo (3-2-0)heptenones, Photochemical rearrangements, Chemical reaction mechanisms, *Rearrangement reactions.

The mechanistic details of the photochemical Buchi rearrangement of bicyclo (3.2.0)hex-6-en-2-ones are examined. (Author)
AD-713 269

PERSISTENT METASTABLE STATES AND THE INHIBITED SCINTILLATION OF He II,
Virginia Univ Charlottesville Dept of Physics
Melvyn R. Fischbach, Huey A. Roberts, and Frank L. Hereford. 2 Jul 69, 6p AROD-4685:9-P
Grant DA-ARO (D)-31-124-G876
Availability: Pub. in Physical Review Letters, v23 n9 p462-464, 1 Sep 69.

Descriptors: (*Helium, *Scintillation), (*Superfluidity, Helium), Alpha bombardment, Liquefied gases, Cryogenics.
Identifiers: Liquid helium.

The scintillation of liquid helium produced by alpha particles has been measured with particular emphasis on the temperature region below 1.25K which had not been studied previously. An interpretation of the observed inhibition of the scintillation below T (lambda) is proposed which attributes the effect to a reduced radiative destruction rate of metastable states in He II. (Author)
AD-713 270

THE MECHANISM OF PHOTOISOMERIZATION OF CYCLOHEXENONES. 10-HYDROXYMETHYL-DELTA (1,9)-2-OCTALONE. THE QUESTION OF HYDROGEN ABSTRACTION FROM BENZENE BY KETONE TRIPLETS,
New York Univ Bronx Dept of Chemistry
David I. Schuster, and Donald F. Brizzolara. 14 Oct 69, 12p AROD-4019:27-C
Grant DA-ARO (D)-31-124-G901
Part XXII of a series on the photochemistry of unsaturated ketones in solution. See also Part XXI, AD-705 891.
Availability: Pub. in Jnl. of the American Chemical Society, v92 n14 p4357-4365, 15 Jul 70.

Descriptors: (*Ketones, Photochemistry), Cyclohexenes, Cyclohexanones, Molecular isomerism, Free radicals.
Identifiers: *Naphthalenone/hydroxymethyl-octahydro, *Cyclohexenones, *Hydrogen abstraction, Photoisomerization, Chemical reaction mechanisms, *Photochemical reactions.

The photochemistry of 10-hydroxymethyl-delta (1,9)-2-octalone (I) has been studied in detail. Irradiation through Pyrex in t-butyl alcohol gives solely and inefficiently lumiketone. In chloroform, toluene, cumene, and benzene, a novel fragmentation reaction occurs in addition to give Delta (9,10)-2-octalone and Delta (1,9)-2-octalone and other products derived from them, as well as products derived from solvent radicals. Quenching and sensitization results indicate that all products are derived from the same radical-like triplet excited state, which is concluded to be the n,pi* triplet. It is concluded that zwitterion intermediates are not involved in any of the photochemical reactions of I. Solvent effects on quantum yields are attributed to stabilization of a higher pi,pi* triplet and/or to complexing with the hydroxyl group of I. A comparison with results obtained by others with other model cyclohexenones is made, and differences in mechanistic conclusions are indicated. (Author)
AD-713 286

SPECIMEN DAMAGE CAUSED BY THE BEAM OF THE TRANSMISSION ELECTRON MICROSCOPE, A CORRELATIVE RECONSIDERATION,
Armed Forces Inst of Pathology Washington D C
For primary bibliographic entry see Field 14B.
AD-713 358

THE EFFECT OF OXYGEN AND QUINONE CONCENTRATION ON THE REVERSIBLE LIGHT-INDUCED PROTON UPTAKE OF THE CHLOROPHYLL b-BENZOQUINONE SYSTEM,
Air Force Cambridge Research Labs L G Hanscom Field Mass
Kenneth P. Quinlan. 26 May 70, 4p Rept no. AFCRL-70-0525
Availability: Pub. in Jnl. of Physical Chemistry, v74 n17 p3303-3305 1970.

Descriptors: (*Quinones, *Photochemistry), (*Chlorophylls, Photochemistry), Oxygen, pH, Protons, Quenching (Inhibition).
Identifiers: Photochemical reactions, *Photovoltaic effect.

The light-induced electron transfer in the chlorophyll-quinone system is accompanied with proton uptake in acidic media. The capacity of the system for proton uptake is greatly effected by quinone concentrations and the presence of oxygen. High concentrations of quinone quenches proton uptake. An unusual enhancement of proton uptake is reported to occur when air is present in the acidicmedia. The study reports the optimum conditions for a photovoltaic device based on the porphyrin-quinone system. (Author)
AD-713 381

NEUTRON ACTIVATION CROSS SECTIONS FOR SOME ISOTOPES OF RUTHENIUM, PALLADIUM, INDIUM, TIN, AND IRIDIUM,
Ballistic Research Labs Aberdeen Proving Ground Md
For primary bibliographic entry see Field 20H.
AD-713 404 HC$3.00 MF$0.65

THE EFFECT OF STRUCTURE ON RADIATION CHEMICAL REACTIVITY,
Ballistic Research Labs Aberdeen Proving Ground Md
Nathan Klein. 1969, 11p

Descriptors: (*Water, *Ionization), (*Radiation chemistry, Water), (*Excitons, Water), Electron bombardment, Decomposition, Electrolytes.
Identifiers: Holes (Electron deficiencies).

Several aspects of the radiation chemistry of water are discussed. It is proposed that the very fast reaction of e (-) (aq) is: e (-) (aq) + H2O (+) yields H2O*. The product of the reaction, H2O*, is an electron-hole pair, or exciton. The very large size and high mobility of the water cluster makes an encounter radius of 25A for the reaction reasonable. The existence, in aqueous solution, of both holes and excitons has been proposed although experimental evidence to date is still so sparse as to be highly conjectural. (Author)
AD-713 551 HC$3.00 MF$0.65

RADIATION CORROSION,
National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.
A. V. Byalobzheskii. 1970, 194p* SFCSI-AEC (TT-70-50005), TT-70-50005
Trans. of mono. Radiatsionnaya Korroziya, Moscow, 1967 216p, by A. Aladjem.

Descriptors: (*Corrosion, *Radiation damage), (*Electrochemistry, *Radiation chemistry), (*Reviews, Corrosion), Dosimetry, Electrolytes, Aluminum, Zirconium, Titanium, Iron, Stainless steel, Copper, Nickel, Uranium, Aqueous electrolytes, Solutions, Carbon tetrachloride, Radiolysis, Water, USSR, Translations.

The monograph deals with the effect of radiation on corrosion and electrochemical processes. There are six chapters besides the introduction, which deals with the general aspects of the interaction of radiation and matter. The author presents the experimental procedures used in corrosion and electrochemical research in radiation fields, and discusses in detail the mechanisms of decomposing, radiolytic, and photoradiation effects of radiation on the kinetics of corrosion processes. The effect of radiation on the corrosion of various materials (iron, aluminum, zirconium, etc.) in electrolytes, in the atmosphere, and in halogenated organic media is described. A wealth of systematized data on the corrosion resistance of metals in radiation fields under various conditions is included. (Author)
AEC-tr-7096 HC$3.00 MF$0.65

REACTIONS OF THE SESQUIOXIDES OF Pm, Nd, AND Sm WITH WATER,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
H. T. Fullam, and F. P. Roberts. Jun 70, 34p
Contract AT (45-1)-1830

Descriptors: (*Radioisotopic heat sources, *Hydrolysis), (*Rare earth compounds, Hydroly-

sis), Oxides, Promethium compounds, Neodymium oxides, Samarium compounds, Solubility, Dissolving.
Identifiers: *Promethium oxides, Samarium oxides.

For abstract, see NSA 24 20.
BNWL-1421 HC$3.00 MF$0.65

PRELIMINARY STUDIES OF THE EFFECTS OF FAST NEUTRONS ON THE OPTICAL PROPERTIES OF ANTHRACENE,
Wisconsin Univ., Madison. Dept. of Physics.
D. W. Pearson, and P. R. Moran. 1968, 7p

Descriptors: (*Anthracene, *Neutron irradiation), (*Dosimeters, *Neutron counters), Optical properties.

For abstract, see NSA 24 20.
COO-1105-159 HC$3.00 MF$0.65

LABELING OF COMPOUNDS USING THE SZILARD-CHALMERS REACTION,
New Mexico Highlands Univ., Las Vegas. Dept. of Chemistry.
V. C. Anselmo. 1970, 4p

Descriptors: (*Labeled substances, Purification), Phosphorus isotopes, Salts.

For abstract, see NSA 24 20.
COO-1618-17 HC$3.00 MF$0.65

DETERMINATION OF FREE ACID IN PLUTONIUM (VI) SOLUTIONS,
Division of Technical Information Extension (AEC), Oak Ridge, Tenn.
D. Thiele, and W. Baehr. Jan 70, 15p
Trans. of Kernforschungszentrum, Karlsruhe. Report (West Germany) KFK-1133.

Descriptors: (*Plutonium compounds, Solutions), pH, Acidity, Nitric acid.

For abstract, see NSA 24 20.
EURFNR-756 HC$3.00 MF$0.65

CRYSTAL AND MOLECULAR STRUCTURE OF A THYMINE PHOTOTRIMER,
Johns Hopkins Univ., Baltimore, Md. School of Hygiene and Public Health.
J. L. Flippen. 1970, 9p

Descriptors: (*Uracils, *Photochemical reactions), Molecular structure, Molecular isomerism, X ray diffraction analysis.
Identifiers: *Thymine.

For abstract, see NSA 24 20.
NYO-2798-52 HC$3.00 MF$0.65

DETERMINATION OF CERIUM, GADOLINIUM, DYSPROSIUM, ERBIUM, AND YTTERBIUM.
National Aeronautics and Space Administration, Washington, D. C.
T. Komori. Sep 70, 16p NASA-TT-F-13177
Tran- Transl. Into English From Bunseki Kagaku (Tokyo), V. 15, 1966 P 589-593

Descriptors: *Dioxides, *Isotopic labeling, *Rare earth elements, *Thorium compounds, Concentration (composition), Ionization, Mass spectrometers, Spike potentials.

For abstract, see STAR 08 21.
N70-38452 HC$3.00 MF$0.65

ON THE FLUORINATION OF PROTACTINIUM,
Oak Ridge National Lab., Tenn.
M. Laser, and E. Merz. 15 May 68, 14p
Trans. of Journal of Inorganic and Nuclear Chemistry (England) v31 p349-360 1969, by R. Gregg Mansfield.

Descriptors: (*Protactinium, *Fluorination), Fluorides, Phase diagrams, Thermochemistry, Translations, West Germany.

For abstract, see NSA 24 20.
ORNL-tr-2350 HC$3.00 MF$0.65

MECHANISM OF THE RADIATION INDUCED DECOMPOSITION OF INORGANIC MOLECULAR IONS.
Progress rept.,
Maryland Univ., College Park. Dept. of Chemical Engineering.
Everett R. Johnson. 1969, 5p
Contract AT (40-1)-3660

Descriptors: (*Radiolysis, *Ions), Nitrates, Radiation chemistry.
Identifiers: Chemical reaction mechanisms.

For abstract, see NSA 24 20.
ORO-3660-3 HC$3.00 MF$0.65

REDUCTION OF PLUTONIUM HEXAFLUORIDE TO PLUTONIUM TETRAFLUORIDE BY THERMAL DECOMPOSITION,
Dow Chemical Co., Golden, Colo. Rocky Flats Div.
Ralph O. Wing, and Robert S. Marshall. 13 Aug 70, 11p
Contract AT (29-1)-1106

Descriptors: (*Plutonium halides, *Reduction (Chemistry)), Pyrolysis, Chlorides, Chemical equilibrium.

For abstract, see NSA 24 20.
REP-1357 HC$3.00 MF$0.65

ANNUAL REPORT (ON RADIATION RESEARCH), JULY 1, 1969-JUNE 30, 1970.
Rept. no. 12, 1 Jul 69-30 Jun 70, on Fundamental research no. 6041.
Mellon Inst., Pittsburgh, Pa. Radiation Research Labs.
10 Aug 70, 17p

Descriptors: (*Radiation chemistry, Research).

For abstract, see NSA 24 20.
RRL-2310-309 HC$3.00 MF$0.65

THE BERKELEY HILAC HEAVIEST ELEMENT RESEARCH PROGRAM,
California Univ., Berkeley. Lawrence Radiation Lab.
Albert Ghiorso. Apr 70, 62p CONF-691124-1
Contract W-7405-eng-48
Presented at the Robert A. Welch Foundation Conference on Chemical Research. XIII. The Transuranium Elements, Houston, Tex. Nov 69.

Descriptors: (*Transuranium elements, Research), Meetings.
Identifiers: *Element 104, *Mendelevium.

For abstract, see NSA 24 20.
UCRL-18633 HC$3.00 MF$0.65

RADIATION-INDUCED FREE RADICAL DESTRUCTION,
California Univ., Berkeley. Lawrence Radiation Lab.
Paul Karl Horan. Jun 70, 95p
Contract W-7405-eng-48

Descriptors: (*Electron spin resonance, Reaction kinetics), (*Amino acids, *Radiolysis), Free radicals, Gamma irradiation, Theses.

For abstract, see NSA 24 20.
UCRL-19849 HC$3.00 MF$0.65

THE PHOTOCHEMISTRY AND BIOCHEMISTRY OF AROMATIC N-OXIDES.
Doctoral thesis,
California Univ., Berkeley. Lawrence Radiation Lab.
Augustinas Algimantas Alkaitis. Sep 70, 122p
Contract W-7405-eng-48

Descriptors: (*Oxygen transport mechanisms, *Photochemistry), (*Nicotinamides, *Photochemical reactions), (*Oxidoreductases, Nicotinamides), Squalene, Oxides, Pyridines, Quantum interactions, Theses.
Identifiers: *Oxygenases, *Nicotinamide/N-oxide, Pyridine/N-oxide, Hydroxylases, Oxidase/squalene, Hydroxylase/laurate.

For abstract, see NSA 24 20.
UCRL-20037 HC$3.00 MF$0.65

PHOTOSENSITIZED AQUATION REACTIONS OF Cr (NH3)5 (NCS) (2+),
California Univ., Los Angeles. Dept. of Chemistry.
John E. Martin, and Arthur W. Adamson. 1969, 30p

Descriptors: (*Complex compounds, *Photochemical reactions), (*Ammino compounds, Photochemical reactions), Chromium compounds, Hydration.
Identifiers: Chromium/pentaammine - thiocyanato, Photosensitizers.

For abstract, see NSA 24 20.
USC-113-P-10-X-1 HC$3.00 MF$0.65

8. EARTH SCIENCES AND OCEANOGRAPHY

8A. Biological Oceanography

REMOTE MEASUREMENT OF OCEAN COLOR AS AN INDEX OF BIOLOGICAL PRODUCTIVITY.
Technical rept.,
Woods Hole Oceanographic Institution Mass
George L. Clarke, Gifford C. Ewing, and Carl J. Lorenzen. 1969, 13p Rept nos. WHOI-Ref-70-41, WHOI-Contrib-2411
Contracts N00014-66-C-0241, NAS12-631
Availability: Pub. in Proceedings of the International Symposium on Remote Sensing of the Environment (6th) Held at Michigan Univ. on 13-16 Oct 69, v2 p991-1001.

Descriptors: (*Sea water, Colors), (*Plankton, Sea water), (*Aerial reconnaissance, Oceans), Marine biology, Chlorophylls, Fluorescence, Light transmission.
Identifiers: Remote sensing, *Chlorophyll concentration.

The feasibility of distinguishing ocean areas containing low to moderate chlorophyll concentrations from flight altitudes up to 10,000 feet is shown experimentally by means of an airborne spectrophotometer. (Author)
AD-713 284

ENZYMES OF GLUCOSE METABOLISM IN THE CAECUM OF THE MARINE BORER BANKIA SETACEA,
British Columbia Research Council Vancouver
For primary bibliographic entry see Field 6A.
AD-713 342

OCCURRENCE OF VIBRIO PARAHAEMOLYTICUS AND RELATED

HEMOLYTIC VIBRIOS IN MARINE ENVIRONMENTS OF WASHINGTON STATE,
Washington Univ Seattle Coll of Fisheries
For primary bibliographic entry see Field 6M.
AD-713 390

THE VALUE OF BLACK SEA DECAPOD CRUSTACEA IN THE FEEDING OF FISHES AND DOLPHINS (Znachenie Desyatinogikh Rakoobraznykh Chernogo Morya v Pitanii Ryb i Delfinov),
Naval Intelligence Command Alexandria Va Translation Div
For primary bibliographic entry see Field 6C.
AD-713 795 HC$3.00 MF$0.65

EXPERIMENTAL STUDY OF THE FOULING PROCESS AT SEA (Eksperimentalnoe Izuchenie Protsessa Obrastaniya v More),
Naval Intelligence Command Alexandria Va Translation Div
M. A. Dolgopolskaya. 28 Oct 70, 23p Rept no. NIC-Trans-3088 (b)
Trans. of Akademiya Nauk URSR, Kiev. Sevastopolska Biologichna Stantsiya. Trudy, v8 p157-173 1964.

Descriptors: (*Fouling, *Aquatic animals), (*Marine biology, Fouling), Barnacles, Pelecypoda, Gastropoda, Mollusca, Invertebrates, Quantitative analysis, Density, Ocean bottom, Experimental data, Algae, Periodic variations, Larvae, Life cycle, Ecology, USSR.
Identifiers: Translations, *Fouling organisms.

Data were gathered for a year on the quantity of organisms which settled monthly. The number of individual fouling organisms can vary monthly - from zero to 224,800 specimens per 1 sq m (barnacles), and from zero to 6,000 per 1 sq m (mussels). Increasing the settlement density up to a known limit stimulates the vital activity of the organisms, but when an optimum value is reached, it suppresses such activity. The total weight of organisms settling during a month per 1 sq m varies from a value less than 1 gram (winter) to 548 g (autumn: September). The total weight of fouling per year per 1 sq m of surface varies as a function of the month when it began; The sizes reached by the fouling organisms for the first month of attached life are a function of settlement and vary from 1 to 8 mm for barnacles and from 0.3 to 1.5 mm for mussels. The settling of larvae onto a new surface free from fouling is more intense than that onto a surface which is already occupied by other organisms. Subsequently, with the growth of the individual colonies there is both crowding out and fouling of some species by others. As a result of all this struggle, the dominant form becomes mussels, which form dense, solid sets restricting the further settlement of larvae. This must be explained by the continuous fouling of stationary objects purely by mussels. The quantity of fouling barnacles predominates on surfaces turned under.
AD-713 796 HC$3.00 MF$0.65

THE INTERRELATIONSHIP OF HYDRODYNAMICAL PROCESSES AND ORGANIC PRODUCTION IN THE OCEAN.
Progress rept.
Nova Univ., Fort Lauderdale, Fla.

May 70, 4p
Contract AT (40-1)-3845

Descriptors: (*Ocean environments, *Primary bilogical productivity), (*Ocean currents, *Ecology), Hydrodynamics, Plankton, Theory.

For abstract, see NSA 24 20.
ORO-3845-2 HC$3.00 MF$0.65

RESOURCES AND FISHERIES OF TUNAS AND RELATED FISHES IN THE ATLANTIC OCEAN,
Far Seas Fisheries Research Lab., Shimizu (Japan).
For primary bibliographic entry see Field 5C.
PB-194 882 HC$3.00 MF$0.65

EFFECTS OF TEMPERATURE AND SALINITY ON THERMAL DEATH IN POSTLARVAL BROWN SHRIMP, PENAEUS AZTECUS.
Galveston Marine Lab., Tex.
For primary bibliographic entry see Field 6F.
PB-195 175 HC$3.00 MF$0.65

8B. Cartography

APPLICATION OF SENSING ARRAYS TO PHOTOGRAMMETRY AND METROLOGY,
Army Engineer Topographic Labs Fort Belvoir Va
Desmond C. O'Connor, and Pi-Fuay Chen. 1970, 14p

Descriptors: (*Optical equipment, Resolution), (*Photogrammetry, Sensors), (*Eye, Bionics), Pattern recognition, Mirrors, Optical tracking.
Identifiers: Metrology.

The performance and function of the human eye are reviewed. A sensing array system devised by using the concept of the involuntary human eye motion is considered. The system's receptor-array is reduced to a moderate size by the introduction of the perturbation effect, thus decreasing the system's complexity and cost, while retaining equivalent or better system resolutions. Also, the serious lead problem of the receptor-array and the complicated, huge, mechanical scanning device are eliminated. Applications of the array systems to metrology photogrammetry are discussed. A one-dimensional experimental sensing array is built and tested. The experimental results show that the system can detect the relative position of an object-image of accuracy better than 0.001 in. Suggestions are made to the extension of the idea in the future. (Author)
AD-713 568 HC$3.00 MF$0.65

THE FREQUENCY DEPENDENCE OF BACKSCATTER FROM ROUGH SURFACES.
Kansas Univ., Lawrence. Center for Research.
For primary bibliographic entry see Field 17I.
AD-847 275 HC$3.00 MF$0.65

PROJECT THEMIS: A CENTER FOR REMOTE SENSING.
Semiannual technical rept. no. 1, Sept 67-Apr 68,
Kansas Univ., Lawrence. Center for Research.
R. D. Ellermeier. Apr 68, 187p CRES-TR-133-2
Contract DAAK02-68-C-0089, ARPA Order-1079
See also Semiannual technical rept. no. 2, AD-683 584. Distribution Limitation now Removed.

Descriptors: (*Mapping, Radar images), (*Natural resources, Aerial reconnaissance), Aerial reconnaissance, Sensors, Radar equipment, Display systems, Terrain, Interactions, Data processing systems, Broadband, Pattern Recognition, Ultrasonic radiation, Geography, Geology, Backscattering, Model tests, Plants (Botany).
Identifiers: Themis project, *Remote sensing, IDECS (Image Discrimination Enhancement and Combination System), Image discrimination enhancement and combination systems.

The report summarizes the technical progress on a broad interdisciplinary effort for the improvement of user utility of remotely sensed data. This effort involves theoretical work, sensor development, processing and display, and data analysis for specific user application. A number of technical reports and memoranda describing work underway are attached. (Author)
AD-847 276 HC$3.00 MF$0.65

PROJECT THEMIS: A CENTER FOR REMOTE SENSING.
Semiannual technical rept. no. 3, Oct 68-Mar 69,
Kansas Univ., Lawrence. Center for Research.
F. T. Ulaby. Mar 69, 189p CRES-TR-133-7
Contract DAAK02-68-C-0089, ARPA Order-1079
See also Semiannual technical rept. no. 2, AD-683 584. Distribution Limitation now Removed.

Descriptors: (*Mapping, Radar images), (*Natural resources, *Aerial reconnaissance), Sensors, Data processing systems, Display systems, Terrain, Pattern recognition, Radar, Simulation, Geology, Geography, Ultrasonic radiation, Backscattering.
Identifiers: Themis project, *Remote sensing.

The report summarizes the technical progress on a broad interdisciplinary effort for the improvement of user utility of remotely sensed data. This effort involves theoretical work, sensor development, processing and display, and data analysis for specific user application. A number of technical reports and memoranda describing work underway are attached. (Author)
AD-853 884 HC$3.00 MF$0.65

THE BAYESIAN APPROACH TO IDENTIFICATION OF A REMOTELY SENSED ENVIRONMENT.
Special interim technical rept.,
Kansas Univ., Lawrence. Center for Research.
Robert Haralick. Jul 69, 69p CRES-TR-133-9
Contract DAAK02-68-C-0089, ARPA Order-1079
Distribution Limitation now Removed.

Descriptors: (*Photogrammetry, Photointerpretation), (*Programming (Computers), Pattern recognition), (*Pattern recognition, Decision theory), Data processing systems, Identification, Detection, Subroutines.
Identifiers: *Remote sensing, Bayesian decision theory, Photogrammetric surveys.

The first part of the paper provides a brief tuturial introduction of the Bayesian approach to identification of a remotely sensed environment. The second part describes the input data deck setup for the Fortran IV program which has been written to implement this approach. The third part describes file usage and subroutine organization, the fourth part provides a listing of the program with a simple sample data set (Author)
AD-860 060 HC$3.00 MF$0.65

MULTI-IMAGE PATTERN RECOGNITION: IDEAS AND RESULTS.
Technical rept.,
Kansas Univ., Lawrence. Center for Research.
Robert M. Haralick. 1969, 220p CRES-TR-133-11
Contract DAAK02-68-C-0089, ARPA Order-1079
Errata sheet inserted. Distribution Limitation now Removed.

Descriptors: (*Photogrammetry, Photointerpretation), (*Pattern recognition, Decision theory), Photographic images, Sensors, Correlation techniques, Classification, Theses.
Identifiers: *Remote sensing.

A tutorial introduction to some of the pattern recognition problems is presented in a unified perspective. Special concentrated effort is given to pattern recognition techniques for use with sequential data especially multi-image data sets. Some of these techniques are experimentally tested on a photographic data set. The following are among the original pattern recognition techniques presented; identifying a data set with a measure of association, spatial quantizing, measurement space clustering, spatial clustering, texture analysis, registering and congruencing images. The spatial quantizing and spatial clustering techniques were tested with some imagery from Michigan's 12 channel scanner system. The spatial quantizing procedure produced a better quality quantized image than the linearly quantized image. The spatial clustering procedure produced a map of the natural homogeneous classes of environmental objects seen like the sensor sees them. (Author)
AD-863 596 HC$3.00 MF$0.65

PROJECT THEMIS: A CENTER FOR REMOTE SENSING.
Semiannual technical rept. no. 4, Apr-Sep 69,
Kansas Univ., Lawrence. Center for Research.
F. T. Ulaby. Sep 69, 114p CRES-TR-133-10
Contract DAAK02-68-C-0089, ARPA Order-1079
See also Semiannual technical rept. no. 3, AD-853 884. Distribution Limitation now Removed.

Descriptors: (*Aerial reconnaissance, Mapping), (*Mapping, Terrain), Radar images, Data processing systems, Pattern recognition, Scattering, Electromagnetic waves, Simulation, Display systems, Geology, Geography, Ultrasonic radiation.
Identifiers: Themis project, *Remote sensing.

The report summarizes the technical progress on a broad interdisciplinary effort for the improvement of user utility of remotely sensed data. This effort involves theoretical work, sensor development, processing and display, and data analysis for specific user application. A number of technical reports and memoranda describing work underway are attached. (Author)
AD-864 859 HC$3.00 MF$0.65

PROJECT THEMIS: A CENTER FOR REMOTE SENSING.
Semiannual technical rept. no. 5, Sep 69-Mar 70,
Kansas Univ., Lawrence. Center for Research.
F. T. Ulaby. Mar 70, 202p CRES-TR-133-14
Contract DAAK02-68-C-0089
See also Semiannual technical rept. no. 3, dated Mar 69, AD-853 884. Distribution Limitation now Removed.

Descriptors: (*Mapping, Radar images), (*Natural resources, Aerial reconnaissance), Sensors, Data processing systems, Display systems, Terrain, Pattern recognition, Polarization, Side-looking radar.
Identifiers: Themis project, *Remote sensing, Idecs (Image discrimination enhancement and combination system), Image discrimination enhancement and combination system.

The report summarizes the technical progress under the subject contract on a broad interdisciplinary effort for the improvement of user utility of remotely sensed data. This effort involves theoretical work, sensor development, processing and display, and data analysis for specific user application. A number of technical reports and memoranda describing work underway are attached. (Author)
AD-869 511 HC$3.00 MF$0.65

APPLICATIONS OF SPACE PHOTOGRAPHY IN GEOLOGY,
Joint Publications Research Service, Washington, D.C.
B. V. Vinogradov, and A. A. Grigorev. 15 Oct 70, 15p
Trans. of Possibilities of Geological Interpretation of Earth Photographs Taken in Space, pub. in Akademiya Nauk SSSR. Izvestiya. Seriya Geologicheskaya, v33 n1 p16-27 1970.

Descriptors: (*Geological surveys, *Spaceborne photography), Stratigraphy, Identifying, Rocks, Erosion, Soils, Networks, Translations, USSR.

Photographs obtained from spaceships contribute to geological knowledge in two ways -- directly, by leading to identification of types of bedrock, and indirectly, through identification of soil and vegetation. Experience in the geological interpretation of space photographs of New Mexico, Arizona and the highlands of the western and central Sahara and Libya and Tibet shows that bedrock in general will have the same tones as on small-scale serial photographs; however, the tones are subject to greater effects from exposure and integration of the fine textures of the image, such as are associated with vegetation and microrelief. (Author)
JPRS-51578 HC$3.00 MF$0.65

RESOLUTION STUDY.
Geological Survey, Washington, D. C. Topographic Div.
H. B. Loving, and R. H. Nugent. 9 Mar 67, 11p
NASA-CR-84634
NASA ORDER R-09-020-024
Seri- Its Tech. Letter Nasa-79

Descriptors: *Aerial photography, *Mapping, *Resolution, *Stereophotography, Earth resources.

For abstract, see STAR 08 21.
N70-38888 HC$3.00 MF$0.65

APPLICATIONS OF REMOTE SENSOR DATA TO CARTOGRAPHIC PROGRAMS.
Geological Survey, Washington, D. C.
W. Sibert. Jul 66, 15p NASA-CR-7741
NASA ORDER R-09-020-024
Seri- Its Tech. Letter Nasa-51

Descriptors: *Mapping, *Remote sensors, *Spaceborne photography, Earth resources, High resolution.

For abstract, see STAR 08 21.
N70-38891 HC$3.00 MF$0.65

PRELIMINARY GEOLOGIC MAP OF THE MONO CRATERS QUADRANGLE, CALIFORNIA.
Geological Survey, Menlo Park, Calif.
R. W. Kistler. 1 Sep 65, 4p NASA-CR-68346
NASA ORDER R-146
Seri- Its Tech. Letter Nasa-9

Descriptors: *California, *Craters, *Geology, Maps.

For abstract, see STAR 08 21.
N70-38897 HC$3.00 MF$0.65

GEOLOGIC EVALUATION OF RADAR IMAGERY OF FLIGHTS 100- B AND 100- C ACROSS THE CENTRAL SIERRA NEVADA, CALIFORNIA.
Geological Survey, Menlo Park, Calif.
P. C. Bateman. May 66, 9p NASA-CR-75525
NASA ORDER R-09-020-015
Seri- Its Tech. Letter Nasa-27

Descriptors: *Aerial photography, *Radar photography, *Topography, California, Color photography.

For abstract, see STAR 08 21.
N70-38899 HC$3.00 MF$0.65

ULTRA-HIGH-ALTITUDE PHOTOGRAPHY COMPILATION EVALUATION.
Geological Survey, Washington, D. C. Topographic Div.
R. H. Nugent. Mar 67, 10p NASA-CR-85483,
NASA-73
NASA ORDER R-09-020-024

Descriptors: *Aerial photography, *High altitude, *Mapping, Nevada, Photointerpretation, Terrain analysis, Topography.

For abstract, see STAR 08 21.
N70-38927 HC$3.00 MF$0.65

TOPOGRAPHIC STUDIES OF PISGAH CRATER, CALIFORNIA.
Geological Survey, Menlo Park, Calif.
R. E. Altenhofen, J. K. Oman, and T. M. Sousa. 22 Jun 65, 109p NASA-CR-63699
NASA ORDER R-146
109 P Seri- Its Tech. Letter Nasa-7

Descriptors: *Aerial photography, *California, *Craters, *Topography, Earth resources, Mapping, Photogrammetry, Photointerpretation, Terrain analysis.

For abstract, see STAR 08 21.
N70-38928 HC$3.00

REMOTE SENSING FOR RESOURCE MANAGEMENT AND FLOOD PLAIN DELINEATION,
Wisconsin Univ., Madison. Dept. of Soil Science.
For primary bibliographic entry see Field 8H.
PB-195 086 HC$3.00 MF$0.65

8C. Dynamic Oceanography

CRUISE REPORT CHAIN CRUISE 98.
Technical rept.,
Woods Hole Oceanographic Institution Mass
Gordon H. Volkmann. Sep 70, 17p Rept no. WHOI-Ref-70-38
Contract N00014-66-C-0241

Descriptors: (*Ocean currents, Measurement), Mooring, Hydrographic surveying, Oceanographic vessels, Deep water, Continental shelves, Oceanographic equipment.
Identifiers: Chain vessel.

Mooring work to be done was the recovery of Station 322, (a two-month study of the upper layer at Site D), and the remains of Station 320 which has already parted by the time of the January cruise but had been left on the bottom because of rough weather. It was planned to set five bottom moorings along 70 degrees W. in an array extending from 37 deg 30 min N. to 28 degrees N. (Author)
AD-713 105 HC$3.00 MF$0.65

USE OF Rn/Ra RATIOS TO DETERMINE AIR/SEA GAS EXCHANGE AND VERTICAL MIXING IN THE OCEAN.
Final technical rept.,
Teledyne Isotopes Palo Alto Calif Palo Alto Labs
David R. Schink, Joel J. Sigalove, Robert L. Charnell, and Norman L. Guinasso, Jr. 6 Feb 70, 50p Rept no. PALTR-223
Contract N00014-69-C-0254

Descriptors: (*Ocean waves, Wind), (*Radioactive isotopes, Tracer studies), Gases, Radon, Radium, Sea water, Sampling, Atmosphere, Interfaces, Radioactive decay, Half life, Transport properties.
Identifiers: Air water interactions, BOMEX (Barbados Oceanographic Meteorological Experiment), Barbados oceanographic meteorological experiment.

A program to measure Rn (222)/Ra (226) ratios in the ocean surface layer as part of the BOMEX experiment has demonstrated that blanks are acceptably low--but significant; that radon collection is essentially complete; and that the gas can be transferred and counted at sea. Nine radon blanks and ten radon samples were run. One profile of radon ratios gave results much as expected. The results are consistent with a boundary film thickness of 10-15 microns. Below the uppermost water layer the vertical eddy diffusivity is approximately 5 sq cm/sec. Absolute values of radon concentration were lower than previously observed. The differences may be due to our larger sample volumes with correspondingly less contamination effect and better blank control. Using air-sampler equipment furnished by Battelle, five air samples were analyzed for radon daughter products. Marine air in this region has 6 dpm/cu m, much less randon than 'average' continental air, but slightly more than expected in the average marine environment. (Author)
AD-713 129 HC$3.00 MF$0.65

SEA SURFACE WIND STRESS: THEORETICAL CALCULATIONS COMPARED WITH DIRECT MEASUREMENTS,
New York Univ Bronx Geophysical Sciences Lab
Michael P. Clancy. May 70, 35p Rept no. GSL-TR-70-6
Contract Nonr-285 (57)

Descriptors: (*Ocean waves, Wind), (*Wind, Measurement), Shear stresses, Drag, Surface properties, Anemometers, Power spectra, Velocity, Friction, Boundary layer, Reynolds number.
Identifiers: *Air water interactions.

Seven days of turbulence measurements made from a thrust anemometer were analyzed. Parametric representations of the wind stress were obtained from the drag law and from the dissipation or spectrum method. These were compared with simultaneous direct measurements of wind stress. It was found that the spectrum method was superior. (Author)
AD-713 167 HC$3.00 MF$0.65

A PROCEDURE FOR COMPUTING AND DISPLAYING TIME VARYING POWER SPECTRA ILLUSTRATED BY APPLICATION TO A GEOPHYSICAL PROCESS.
Technical rept.,
Johns Hopkins Univ Baltimore Md Chesapeake Bay Inst
Donald G. Wilson. Aug 70, 45p Rept nos. Ref-70-7, TR-67
Contract N00014-67-A-0163-0006

Descriptors: (*Ocean waves, Power spectra), (*Time series analysis, Geophysics), Integral transforms, Fourier analysis, Series, Digital computers, Data processing systems, Algorithms, Real time.
Identifiers: Fast Fourier transform, Computer graphics, Spectrum analysis.

Computing time dependent power spectra is an important method for studying nonstationarities in signals. An efficient procedure for computing such spectra and displaying them immediately is requisite for effective application. The method presented is based on a date window which moves along the signal in unit increments. The spectrum is updated for each new sample. All spectra are displayed on a computer graphic terminal and the algorithm was deliberately constructed to make computer graphic display efficient. (Author)
AD-713 190 HC$3.00 MF$0.65

SAND WAVES AND TIDAL CHANNELS IN THE ENTRANCE TO CHESAPEAKE BAY.
Old Dominion Univ Norfolk Va Inst of Oceanography
For primary bibliographic entry see Field 8H.
AD-713 195 HC$3.00 MF$0.65

SUMMAC - A NUMERICAL MODEL FOR WATER WAVES.
Technical rept.,
Stanford Univ Calif Dept of Civil Engineering
Robert K. -C. Chan, and Robert L. Street. Aug 70, 170p Rept no. TR-135
Contract Nonr-225 (71), Grant NSF-GK-2506

Descriptors: (*Water waves, Mathematical models), Ocean waves, Wave functions, Velocity, Equations of motion, Difference equations, Simulation, Computer programs.
Identifiers: SUMMAC computer program, Computerized simulation.

The work focuses on the numerical studies of large water waves with particular application to storm-generated waves and tsunamis. The specific objective is the exact simulation on a digital computer of nonlinear waves in the shallow water zones. The study is based on the simulation technique called SUMMAC (the Stanford-University-Modified-Marker-And-Cell Method). The flow field is represented by a rectangular mesh of cells and a line of hypothetical particles which defines the free surface. Finite-difference Navier-Stokes equations are used as the governing equations of the velocity fields while the pressure field is obtained by solving a finite-difference Poisson's equation. The currently implemented SUMMAC is limited to waves that are non-breaking and non-turbulent. (Author)
AD-713 444 HC$3.00 MF$0.65

LABORATORY INVESTIGATIONS ON AIR-SEA INTERACTIONS.
Technical rept.,
Stanford Univ Calif Dept of Civil Engineering
En Yun Hsu, and Hsi Yen Yu. Aug 70, 42p Rept no. TR-137
Contract Nonr-225 (71), Grant NSF-GK-2506

Descriptors: (*Ocean waves, Wind), Models (Simulations), Heat transfer, Statistical data, Reynolds number, Wind tunnels, Turbulent boundary layer, Simulation, Interactions, Surface roughness.
Identifiers: *Air water interactions.

Since the comprehensive review on wind wave generation by Ursell in 1956, there have been renewed, intensive studies, theoretical as well as experimental on the subject. Although significant contributions have been made by many investigators, the final goal of achieving a basic understanding of the fundamental mechanism of energy transfer between a turbulent air stream and the ocean has not been realized. The dearth of systematic measurements taken under controlled conditions closely comparable to those of Miles' model was a motivation for our research program. Experiments were designed for measuring the wave induced perturbation pressure under steady-state and unsteady-state conditions. Other experiments were also devised for measuring growth of mechanically generated waves subjected to wind action. This paper presents a summary of the Stanford experimental data in the inviscid range, compares the Stanford data and other existing data to the theory, and suggests specific and fruitful avenues for further study. (Author)
AD-713 469 HC$3.00 MF$0.65

A DETERMINISTIC VIEW OF SPECTRUM AND CROSS-SPECTRUM ANALYSIS,
Army Coastal Engineering Research Center Washington D C
D. Lee Harris. 1968, 15p

Descriptors: (*Ocean waves, Power spectra), Stochastic processes, Regression analysis, Statistical functions, Integral transforms, Fourier analysis, Time series analysis.
Identifiers: *Spectrum analysis.

It is often possible to distinguish several more or less distinct wave trains when looking at the surface of the sea. The records of water elevation at a fixed point in a horizontal plane will then appear to be the sum of several periodic terms. The records of many other phenomena show a similar appearance and it is often desirable to investigate the relations between variability and periodicity of the record. Investigations of this type are called spectrum analyses. (Author)
AD-713 534 HC$3.00 MF$0.65

MOORING SUMMARY 1969,
Woods Hole Oceanographic Institution Mass
For primary bibliographic entry see Field 13J.
AD-713 598 HC$3.00 MF$0.65

ON THE TURBULENT FLOW OVER A WAVY BOUNDARY,
Scripps Institution of Oceanography La Jolla Calif
For primary bibliographic entry see Field 20D.
AD-713 627

DIFFUSION OF THE CORE OF MEDITERRANEAN WATER ABOVE THE MID-ATLANTIC RIDGE CREST.
Technical rept.,
Woods Hole Oceanographic Institution Mass
Eli Joel Katz. 14 Oct 69, 17p Rept nos. WHOI-Ref-70-54, WHOI-Contrib-2368
Contracts N00014-66-C-0241, Nonr-4029 (00)
Availability: Pub. in Deep-Sea Research, v17 p611-625 1970.

Descriptors: (*Mediterranean Sea, Salinity), (*Sea water, Diffusion), Interfaces, Atlantic Ocean, Hydrographic surveying.
Identifiers: Midatlantic ridge.

Abrupt temperature inversions of as much as 0.74C in 15 m are reported from stations above the crest of the Mid-Atlantic Ridge to the north of the Azores. These inversions occur below 700 meters and mark the upper boundary of a saline layer of Mediterranean Water. By assuming that this layer has isentropically penetrated into a less-saline water column, the temperature-salinity diagrams of critical profiles are reconstructed. The thickest penetrations (150 meters) were found over the median valley of the ridge. Comparable interfaces between cold less-saline water above and warm saline water below have previously been described by a (static) gravitational stability parameter. For the observed values of this parameter, tank experiments have indicated that there would be vigorous turbulent convection of both heat and salt across the interface. Evidence of the result of rapid diffusion of the core layer is found in a re-examination of the hydrographic data from this area. (Author)
AD-713 836

OCEAN SURFACE EFFECTS GENERATED BY A NEARBY UNDERGROUND EXPLOSION AT THE AMCHITKA TEST.
Tetra Tech, Inc., Pasadena, Calif.
For primary bibliographic entry see Field 18C.
For abstract, see NSA 24 20.
NVO-289-6 HC$3.00 MF$0.65

A STUDY OF INTERNAL WAVES IN THE STRAIT OF GIBRALTAR DURING OCTOBER - NOVEMBER 1967.
Saclant ASW Research Center, La Spezia (Italy).
J. Ziegenbein. 15 Nov 68, 56p SACLANTCEN-TR-127

Descriptors: *Mediterranean sea, *Sea water, *Stratification, *Temperature distribution, *Wave fronts, Stability, Thermistors, Tides, Water waves.

For abstract, see STAR 08 21.
N70-38607 HC$3.00 MF$0.65

THE INTERRELATIONSHIP OF HYDRODYNAMICAL PROCESSES AND ORGANIC PRODUCTION IN THE OCEAN.
Nova Univ., Fort Lauderdale, Fla.
For primary bibliographic entry see Field 8A.
For abstract, see NSA 24 20.
ORO-3845-2 HC$3.00 MF$0.65

8D. Geochemistry

COMPOSITION OF THE EARTH'S UPPER MANTLE.
Southwest Center for Advanced Studies Dallas Tex
For primary bibliographic entry see Field 8G.
AD-713 408 HC$3.00 MF$0.65

CORRELATION AND CHRONOLOGY OF ORE DEPOSITS AND VOLCANIC ROCKS.
Annual progress rept.,
Arizona Univ., Tucson. Lab. of Isotope Geochemistry.
Paul E. Damon. Jun 70, 192p
Contract AT (11-1)-689

Descriptors: (*Geochronology, Mineral deposits), (*Radioactive age determination, *Volcanic ejecta), Trace elements, Radiochemistry, Mass spectroscopy, X ray analysis, X ray fluorescence, Correlation.

For abstract, see NSA 24 20.
COO-689-130 HC$3.00 MF$0.65

CHEMICAL ECOLOGY.
Translation Consultants, Ltd., Arlington, Va.
For primary bibliographic entry see Field 6F.
For abstract, see STAR 08 21.
N70-38373 HC$3.00 MF$0.65

PREDICTION OF SODIUM CONCENTRATION IN LIGNITE.
Bureau of Mines, Washington, D.C.
For primary bibliographic entry see Field 21D.
PB-194 940 HC$3.00 MF$0.65

8E. Geodesy

AURORAL OVAL PLOTTER AND NOMOGRAPH FOR DETERMINING CORRECTED GEOMAGNETIC LOCAL TIME, LATITUDE, AND LONGITUDE FOR HIGH LATITUDES IN THE NORTHERN HEMISPHERE.
Air Force Cambridge Research Labs L G Hanscom Field Mass
For primary bibliographic entry see Field 4A.
AD-713 170 HC$3.00 MF$0.65

HYDROLOGIC INTERPRETATION OF NIMBUS VIDICON IMAGE - GREAT SALT LAKE, UTAH.
Geological Survey, Washington, D. C.
D. C. Hahl, and A. H. Handy. Nov 66, 6p NASA-CR-79887
NASA ORDER R-09-020-015
Seri- Its Tech. Letter Nasa-61

Descriptors: *Hydrology, *Nimbus satellites, *Photointerpretation, *Satellite television, Utah, Vidicons.

For abstract, see STAR 08 21.
N70-38843 HC$3.00 MF$0.65

8F. Geography

PHYSICAL GEOGRAPHY OF THE USSR.
Revised ed.,
Assistant Chief of Staff for Intelligence (Army) Washington D C
G. K. Tushinskii. 12 Sep 70, 292p Rept no. ACSI-J-6585-Rev
Trans. from mono. Fizicheskaya Geografiya SSSR, Moscow, 1966. See also report dated 5 Feb 70, AD-703 032.

Descriptors: (*Geography, USSR), Geology, Climatology, Terrain, Oceanology, Hydrology, Natural resources, Permafrost, Glaciers, Natural history, Agriculture, Textbooks.

The textbook consists of two parts: 'A General Survey of the USSR' and 'A Regional Survey of the USSR'. The general survey of the physical nature of the USSR as a whole characterizes the basic geographic natural laws on the territory of the USSR, and the regional survey devotes considerable attention to the characteristics of the individual countries and the physico-geographic regions within these countries. The book differs from the first edition (AD-703 032) in that many sections of it have been revised and new chapters added. (Author)
AD-713 839 HC$3.00 MF$0.65

GEMINI PHOTOGRAPHY EVALUATION.
Geological Survey, Washington, D. C. Topographic Div.
R. H. Nugent, and L. E. Starr. Mar 67, 14p NASA-CR-85515
NASA ORDER R-09-020-024
Seri- Its Tech. Letter Nasa-69

Descriptors: *Earth resources, *Gemini flights, *Mapping, *Spaceborne photography, Photoreconnaissance, Systems analysis, Terrain analysis, Topography.

For abstract, see STAR 08 21.
N70-38844 HC$3.00 MF$0.65

INFRARED INVESTIGATIONS STATUS REPORT, 1 JUL. - 30 SEP. 1966.
Geological Survey, Washington, D. C.
R. M. Moxham. Nov 66, 13p NASA-CR-79892
NASA ORDER R-146

Descriptors: *Aerial photography, *Infrared scanners, California, Earth resources, Geology, Infrared reflection, Radiometers, Rocks.

For abstract, see STAR 08 21.
N70-38883 HC$3.00 MF$0.65

REFLECTANCE OF ROCKS AND MINERALS TO VISIBLE AND ULTRAVIOLET RADIATION.
Geological Survey, Washington, D. C.
H. V. Watts. Jul 66, 69p NASA-CR-76300
NASA ORDER R-146-09-020-006
Seri- Its Tech. Letter Nasa-32

Descriptors: *Light (visible radiation), *Minerals, *Rocks, *Spectral reflectance, *Ultraviolet reflection, Earth resources.

For abstract, see STAR 08 21.
N70-38884 MF$0.65

PRELIMINARY STUDIES OF SOIL PATTERNS OBSERVED IN RADAR IMAGES, BISHOP AREA, CALIFORNIA.
Geological Survey, Washington, D. C.
M. F. Sheridan. Nov 66, 8p NASA-CR-80643
NASA ORDER R-09-020-015
Seri- Its Tech. Letter Nasa-63

Descriptors: *Aerial photography, *Radar photography, *Soils, California, Earth resources, Photointerpretation, Vegetation.

For abstract, see STAR 08 21.
N70-38885 HC$3.00 MF$0.65

INTERPRETATION OF ULTRAVIOLET IMAGERY OF THE METEOR CRATER, SALTON SEA AND ARIZONA SEDIMENTARY TEST SITES (MISSION 18, JANUARY 1966).
Geological Survey, Washington, D. C.
W. R. Hemphill. Aug 66, 61p NASA-CR-77594
NASA ORDER R-146-09-020-006
Seri- Its Tech. Letter Nasa-39 and Nasa Suppl-39a

Descriptors: *Aerial photography, *Meteorite craters, *Sedimentary rocks, *Ultraviolet photometry, *Ultraviolet reflection, Arizona, Earth resources, Lakes, Photointerpretation.

For abstract, see STAR 08 21.
N70-38886 HC$3.00 MF$0.65

RADAR IMAGERY OF CEDAR CITY - IRON SPRINGS AREA, UTAH PRELIMINARY REPORT.
Geological Survey, Denver, Colo.
P. L. Williams. Sep 66, 18p NASA-CR-78780
NASA ORDER R-09-020-015
Seri- Its Tech. Letter Nasa-44

Descriptors: *Aerial photography, *Photointerpretation, *Radar photography, Earth resources, Geology, Hydrology, Topography, Utah.

For abstract, see STAR 08 21.
N70-38887 HC$3.00 MF$0.65

EVALUATION OF NIMBUS 1 HIGH RESOLUTION INFRARED RADIOMETER (HRIR) IMAGERY.
Geological Survey, Washington, D. C.
M. A. Conti. Apr 67, 19p NASA-CR-85482, NASA-35
NASA ORDER R-09-020-011
Seri- Its Tech. Letter Nasa-35

Descriptors: *Geology, *Infrared photography, *Satellite observation, *Terrain analysis, Earth resources program, High resolution, Imaging techniques, Infrared detectors, Nimbus satellites.

For abstract, see STAR 08 21.
N70-38895 HC$3.00 MF$0.65

PRELIMINARY RESULTS OF AERIAL INFRARED SURVEYS AT PISGAH CRATER, CALIFORNIA.
Geological Survey, Washington, D. C.
W. A. Fischer, J. D. Friedman, and T. M. Sousa.
22 Apr 65, 16p NASA-CR-62908
NASA ORDER R-146
Seri- Its Tech. Letter Nasa-5

Descriptors: *Airborne equipment, *Infrared scanners, *Reflectance, Aerial reconnaissance, Geology, Infrared reflection, Remote sensors, Rocks.

For abstract, see STAR 08 21.
N70-38898 HC$3.00 MF$0.65

EVALUATION OF NIMBUS VIDICON PHOTOGRAPHY - SOUTHWEST FRANCE AND NORTHEAST SPAIN.
Geological Survey, Washington, D. C.
For primary bibliographic entry see Field 8G.
For abstract, see STAR 08 21.
N70-38933 HC$3.00 MF$0.65

GEOLOGICAL EVALUATION OF NIMBUS VIDICON MAGERY - NORTHWEST GREENLAND.
Geological Survey, Washington, D. C.
For primary bibliographic entry see Field 8G.
For abstract, see STAR 08 21.
N70-38934 HC$3.00 MF$0.65

GEOLOGICAL EVALUATION OF RADAR IMAGERY, APPALACHIAN PIEDMONT, HARFORD AND YORK COUNTIES, MARYLAND AND PENNSYLVANIA.
Geological Survey, Washington, D. C.
For primary bibliographic entry see Field 8G.
For abstract, see STAR 08 21.
N70-38935 HC$3.00 MF$0.65

RADAR IMAGERY - SALTON SEA AREA, CALIFORNIA.
Geological Survey, Menlo Park, Calif.
For primary bibliographic entry see Field 8G.
For abstract, see STAR 08 21.
N70-38937 HC$3.00 MF$0.65

GEOLOGICAL EVALUATION OF RADAR IMAGERY OF THE SPANISH PEAKS REGION, COLORADO.
Geological Survey, Denver, Colo.
For primary bibliographic entry see Field 8G.
For abstract, see STAR 08 21.
N70-38938 HC$3.00 MF$0.65

INFRARED IMAGERY OF PART OF THE HIGH CASCADE RANGE AND MC KENZIE RIVER VALLEY, OREGON.
Geological Survey, Menlo Park, Calif.
For primary bibliographic entry see Field 8G.
For abstract, see STAR 08 21.
N70-38939 HC$3.00 MF$0.65

GEOLOGIC EVALUATION OF INFRARED IMAGERY OF HIGHLY FAULTED VOLCANIC TERRANE IN SOUTHEAST OREGON.
Geological Survey, Menlo Park, Calif.
For primary bibliographic entry see Field 8G.
For abstract, see STAR 08 21.
N70-38941 HC$3.00 MF$0.65

RADAR IMAGERY - PARMACHENEE LAKE AREA, WEST CENTRAL MAINE.
Geological Survey, Washington, D. C.
For primary bibliographic entry see Field 8G.
For abstract, see STAR 08 21.
N70-38942 HC$3.00 MF$0.65

GEOLOGIC EVALUATION OF RADAR IMAGERY OF THE CENTRAL PART OF THE OREGON HIGH CASCADE RANGE.
Geological Survey, Menlo Park, Calif.
For primary bibliographic entry see Field 8G.
For abstract, see STAR 08 21.
N70-38943 HC$3.00 MF$0.65

EXTENT OF RELICT SOILS REVEALED BY GEMINI 4 PHOTOGRAPHS.
Geological Survey, Denver, Colo.
For primary bibliographic entry see Field 8G.
For abstract, see STAR 08 21.
N70-38974 HC$3.00 MF$0.65

AN EVALUATION OF THE GEMINI 4 COLOR PHOTOS OF THE GULF OF CALIFORNIA-CENTRAL TEXAS AREA.
Geological Survey, Denver, Colo.
For primary bibliographic entry see Field 8G.
For abstract, see STAR 08 21.
N70-38975 HC$3.00 MF$0.65

8G. Geology and Mineralogy

NEAR-BOTTOM STUDIES OF THE EAST PACIFIC RISE CREST AND TECTONICS OF THE MOUTH OF THE GULF OF CALIFORNIA,
Scripps Institution of Oceanography San Diego Calif Marine Physical Lab
For primary bibliographic entry see Field 8J.
AD-713 165 HC$3.00 MF$0.65

STATIC DETERMINATION OF THE EQUATION-OF-STATE OF CEDAR CITY TONALITE.
Final rept.,
Battelle Memorial Inst Columbus Ohio Columbus Labs
Phillip N. La Mori. May 70, 82p DASA-2527
Contract DASA01-69-C-0053

Descriptors: (*Igneous rock, Compressive properties), (*Underground explosions, Explosion effects), Equations of state, Porosity, Quartz, Hydrostatics, Sampling, Density, Cracks, Strain gages, Mathematical analysis, Tables.
Identifiers: Tonalite, Cedar city tonalite, Ground motion.

Static compressibility measurements were made on samples of Cedar City tonalite of nominal densities of 2.37, 2.54, and 2.61 g/cc. The purpose of these measurements was to provide equation-of-state data for code calculations. Water-saturated and dry samples were cycled to 0-12-0-24-0-38-0 kb in a piston-cylinder solid pressure media apparatus. The effect of cycling the dry samples caused the denser samples to expand on cycling; the low density sample showed a large, permanent negative strain after the 0-12 kb cycle. Further crack closure on cycling was elastic. At 40 kb the samples were approaching a density which suggested all the cracks and pores had been removed. The saturated samples behaved much differently than the dry samples. Their delta V was less, their hystersis was less and their compressibility curves reproduced on cycling. Hydrostatic cycling experiments were made to 9 kb using axially and circumferentially mounted strain gages on copper-jacketed rock cylinders. The rocks showed permanent set to pressures of 1 kb. Above 1 kb the cracks and pores appeared to be removed elastically. With a few notable exceptions, the linear compressibilities of all the samples were within 10 percent of each other. Thus, with these exceptions and the exclusion of the lower density (2.37 g/cc) material, the rock seems generally homogenous and isotropic elastically. (Author)
AD-713 175 HC$3.00 MF$0.65

RESEARCH ACTIVITIES IN THE FIELD OF MATERIALS SCIENCE.
North Carolina Univ Chapel Hill Materials Research Center
For primary bibliographic entry see Field 11G.
AD-713 198 HC$3.00 MF$0.65

SEISMIC REFRACTION MEASUREMENTS IN THE WESTERN MEDITERRANEAN SEA.
Technical rept.,
Woods Hole Oceanographic Institution Mass
Davis A. Fahlquist, and John B. Hersey. 22 Jun 67, 68p Rept nos. WHOI-Ref-70-35, WHOI-Contrib-1955
Contracts Nonr-1367 (00), NObsr-72521
Availability: Pub. in Bulletin de l'Institut Oceanographique, Monaco, v67 n1386 p52 1969.

Descriptors: (*Structural geology, *Mediterranean Sea), (*Echo ranging, Hydrographic surveying), Deep water, Sedimentation, Ocean bottom, Hydrophones, Reflection, Charges (Explosive), Oceanographic vessels.
Identifiers: Chain vessel, Earth crust, *Seismic profiling.

Seismic refraction and reflection measurements were made in 1958, 1959, and 1961 to determine the crustal structure underlying the western Mediterranean Sea. Refraction measurements were designed to detail the velocity-depth distribution within the earth's crust and to determine the depth to mantle wherever possible. The reflection measurements yield information about the structure of the sediments and rocks at shallow depths below the sea floor. An interpretation of the results is presented. (Author)
AD-713 203

THE TRAVEL TIMES OF S AND SKS,
Texas Univ Dallas
For primary bibliographic entry see Field 8K.
AD-713 303

COMPOSITION OF THE EARTH'S UPPER MANTLE.
Final rept. 10 May 66-31 Aug 70,
Southwest Center for Advanced Studies Dallas Tex
J. L. Carter, and D. C. Presnall. 31 Aug 70, 44p
AROD-6435:3-EN
Contract DA-31-124-ARO (D)-463

Descriptors: (*Structural geology, Geochemistry), Pressure, Liquids, Minerals, Petrography, Calcium oxides, Magnesium oxides, Aluminum compounds, Silicon dioxide.
Identifiers: *Earth mantle.

The report presents the results of studies of the nature and composition of the earth's upper mantle, using petrography, analytical, and synthetic techniques. The theoretical basis for these studies was established and subsequently high pressure liquidus studies were carried out using the system CaO-MgO-Al2O3-SiO2. This system was chosen to model a composition of the upper mantle because (1) it contains all the major minerals thought to exist in the upper mantle and about 90 percent of the composition of the mantle can be represented by this system, and (2) it contains the maximum number of components that can be handled geometrically with complete rigor and generality. Detailed accounts of the work are contained in the publications which were prepared during the course of the investigation. (Author)
AD-713 408 HC$3.00 MF$0.65

MULTIPLE REFLECTIONS IN A WATER LAYER AND THEIR EFFECT ON THE RELIABILITY OF DATA INTERPRETATION IN SEISMIC MARINE SURVEYING,
Michigan Univ Ann Arbor Inst of Science and Technology
For primary bibliographic entry see Field 8J.
AD-713 721 HC$3.00 MF$0.65

THE POSSIBILITY OF DETERMINING THE DEPTH OF THE MOHOROVICIC DISCONTINUITY FOR A THREE-LAYER EARTH'S CRUST,
Michigan Univ Ann Arbor Inst of Science and Technology
I. Sh. Rakhimova. 1970, 13p Rept no. VESIAC-13632
Contract SD-78
Trans. of unidentified Russian language article.

Descriptors: (*Mohorovicic discontinuity, Position finding), Temperature, Thickness, Basalt, Density, Phase studies, USSR.
Identifiers: Translations, Earth crust.

There are two opposite points of view about the nature of the surface dividing the earth's crust from the mantle, i.e. the Mohorovicic discontinuity. Some investigators think that the reason for the abrupt change of seismic velocities and density on the Moho is a difference in the chemical composition of the lower part of the earth's crust and upper mantle--basaltic in the earth's crust and peridotite or dunite in the mantle. Others regard it as a boundary on which a phase transition of the basaltic into a denser modification of it of the type of eclogite occurs. If the phase nature of the Moho is taken as a basis, it is possible to arrive at a quantitative solution of the problem of determination of the thickness of the basaltic layer or the depth of occurrence of the Moho as a function of the depths of the sedimentary and granitic layers for the continental sections of the earth's crust. That becomes possible because the position of the Moho is determined by values of pressure and temperature, the distribution of which at a given thickness of the crust can be established. (Author)
AD-713 722 HC$3.00 MF$0.65

A METHOD OF SOLUTION OF THE INVERSE PROBLEM OF SEISMIC SURVEYING IN THE CASE OF A TILTED LAYERED MEDIUM,
Michigan Univ Ann Arbor Inst of Science and Technology
A. S. Kefeli. 1970, 6p Rept no. VESIAC-13311
Contract SD-78
Trans. of unidentified Russian language article.

Descriptors: (*Ores (Metal sources), Echo ranging), Geophysical prospecting, Minerals, Ores (Nonmetallic), USSR.
Identifiers: Translations, *Seismic surveys.

Until recently the method of solution of inverse problems for continuous media were limited to the particular case where the velocity varies with depth and a horizontal gradient is absent. In connection with the development of seismic surveying for ore, a number of investigations of recent years have been devoted to the solution of inverse problems for more complex models of continuous media. In the case of tilted plane-parallel layered medium (monocline), the inverse problem can be solved by a very simple method which utilizes the construction in the lower half-plane of a time field, which is then converted into a velocity field. (Author)
AD-713 723 HC$3.00 MF$0.65

THE DEEP STRUCTURE OF THE EARTH'S CRUST AND TECTONICS OF AZERBAIDZHAN ACCORDING TO DATA OF GEOPHYSICAL INVESTIGATIONS,
Michigan Univ Ann Arbor Inst of Science and Technology
I. O. Tsimelzon. 1970, 17p Rept no. VESIAC-13634
Contract SD-78
Trans. of unidentified Russian language article.

Descriptors: (*Structural geology, USSR), Gravity, Anomalies, Mohorovicic discontinuity, Basalt, Thickness, Geophysics, Geological survey.

Identifiers: Translations, Azerbaidzhan, *Earth crust, Gravity anomalies, Tectonics.

During 1959-1962, an investigation was conducted of the deep structure of the earth's crust of the territory of Azerbaidzhan and of the tectonics of its oil-bearing regions on the basis of results of a quantitative interpretation of gravity anomalies. The gravity anomalies were interpreted with consideration of all the geological-geophysical data available on Azerbaidzhan and adjacent regions. On the basis of the results of the interpretation of regional gravity anomalies, sections of the earth's crust along seven profiles were plotted schematically, as well as structural schemes for the principal layers of the earth's crust. (Author)
AD-713 724 HC$3.00 MF$0.65

RESPONSE OF ROCK INCLUSIONS TO AIR BLAST.
Final rept. May 69-May 70,
Naval Civil Engineering Lab., Port Hueneme, Calif.
Robert J. Odello. Jun 70, 28p NCEL-TN-1085
Distribution Limitation now Removed.

Descriptors: (*Nuclear explosions, Rock (Geology)), (*Rock (Geology), *Electric cables), Vulnerability, Response, Blast, Soils, Granite, Explosion effects, Electric insulation, Modulus of elasticity, Thickness, Sand, Damage, Air burst, Mathematical predictions.
Identifiers: *Rock inclusions, Overpressure, *Rock mechanics, Soil arching.

Three instrumented granite rocks were buried at 2-, 3-, and 4-foot depths at the 78-foot range from ground zero in the 100-ton AN/FO (ammonium nitrate-fuel oil) test conducted at the Defence Research Establishment Suffield (DRES), Ralston, Alberta, Canada on 28 August 1969. The test was part of a study to access the vulnerability of buried cables to damage by rock inclusions in soil. The objective of the test was to provide field data on the relative displacement due to air blast between rock inclusions and the surrounding soil and to compare these data with the results of available theories. Results showed that the peak surface overpressure was 515 psi and the maximum relative displacements of the rocks were 0.90, 0.20, and 0.40- inches at the 2-, 3-, and 4-foot depths respectively. The small relative displacement of the three-foot deep rock was caused by soil arching over the rock; for the other rocks the theories predicted relative displacements within 40 percent of the measured values. (Author)
AD-872 810 HC$3.00 MF$0.65

CORRELATION AND CHRONOLOGY OF ORE DEPOSITS AND VOLCANIC ROCKS.
Arizona Univ., Tucson. Lab. of Isotope Geochemistry.
For primary bibliographic entry see Field 8D.
For abstract, see NSA 24 20.
COO-689-130 HC$3.00 MF$0.65

APPLICATIONS OF SPACE PHOTOGRAPHY IN GEOLOGY,
Joint Publications Research Service, Washington, D.C.
For primary bibliographic entry see Field 8B.
JPRS-51578 HC$3.00 MF$0.65

GEOLOGICAL SHIFTS AT THE DIVIDING LINE BETWEEN THE MIDDLE AND UPPER DEVONIAN FORMATIONS IN THE CZECH MASSIF.
O Pohybech Na Rozhrani Stredniho A Svrchniho Devonu V Ceskem Masivu
Techtran Corp., Glen Burnie, Md.
K.-A. Troeger. Sep 70, 4p NASA-TT-F-13146
Contract NASW-2037
Coll- 4 P Refs Tran- Transl. Into English From Casopis Mineral. Geol. (Prague), V. 7, No. 2, 1962 P 165-166 Subm- Submitted for Publication

Descriptors: *Czechoslovakia, *Formations, *Geological faults, Earth movements, Mountains, Sediments.

For abstract, see STAR 08 21.
N70-38320 HC$3.00 MF$0.65

COMPOSITION OF BASALT FLOWS AT PISGAH CRATER, CALIFORNIA - PRELIMINARY DATA.
Geological Survey, Washington, D. C.
J. D. Friedman. Jul 66, 41p NASA-CR-76716
NASA ORDER R-146
Seri- Its Tech. Letter Nasa-20

Descriptors: *Basalt, *Craters, *Lithology, California, Earth resources, Electron probes, Flow characteristics, Infrared spectroscopy, Spectroscopic analysis, Surveys, Volcanology, X ray analysis.

For abstract, see STAR 08 21.
N70-38845 HC$3.00 MF$0.65

USE OF INFRARED IMAGERY AND COLOR PHOTOGRAPHY IN STUDY OF MISSILE IMPACT CRATERS.
Geological Survey, Washington, D. C.
D. Cummings, D. E. Gault, and H. J. Moore. Apr 67, 7p NASA-CR-85481
NASA ORDER R-09-020-015
Seri- Its Tech. Letter Nasa-75

Descriptors: *Aerial photography, *Color photography, *Craters, *Impact damage, *Infrared photography, Daytime, Earth resources program, Infrared detectors, Missile tests.

For abstract, see STAR 08 21.
N70-38846 HC$3.00 MF$0.65

PRELIMINARY EVALUATION OF RADAR IMAGERY OF YELLOWSTONE PARK, WYOMING.
Geological Survey, Washington, D. C.
R. L. Christiansen, K. L. Pierce, H. J. Prostka, and E. T. Ruppel. Jul 66, 24p NASA-CR-76711
NASA ORDER R-09-020-015
Seri- Its Tech. Letter Nasa-30

Descriptors: *Glaciology, *Radar photography, *Topography, Aerial reconnaissance, Earth resources, Geological faults, Radar maps, Systems analysis, Wyoming.

For abstract, see STAR 08 21.
N70-38847 HC$3.00 MF$0.65

LIQUID NITROGEN BLACKBODY FOR SPECTRAL EMITTANCE STUDIES.
Geological Survey, Washington, D. C.
D. L. Daniels, and A. E. Stoddard. Jul 66, 16p
NASA-CR-113209
NASA ORDER R-146-09-020-006
Seri- Its Tech. Letter Nasa-57

Descriptors: *Black body radiation, *Cryogenic equipment, *Emittance, *Rocks, Earth resources, Liquid nitrogen, Spectral emission.

For abstract, see STAR 08 21.
N70-38889 HC$3.00 MF$0.65

GEOLOGICAL UTILIZATION OF GEMINI COLOR PHOTOGRAPH OF DUBA AREA, SAUDI ARABIA.
Geological Survey, Washington, D. C.
R. F. Johnson, and J. A. Mac Kallor. Aug 66, 12p
NASA-CR-77593
NASA ORDER R-09-020-015
Seri- Its Tech. Letter Nasa-43

Descriptors: *Color photography, *Gemini 5 flight, *Geological faults, *Spaceborne photography, Asia, Earth resources, Photointerpretation.

For abstract, see STAR 08 21.
N70-38890 HC$3.00 MF$0.65

GEOLOGIC APPRAISAL OF RADAR IMAGERY OF SOUTHWESTERN OREGON.
Geological Survey, Menlo Park, Calif.
W. P. Irwin. Jun 66, 13p NASA-CR-76690
NASA ORDER R-09-020-015
Seri- Its Tech. Letter Nasa-23

Descriptors: *Aerial photography, *Geology, *Oregon, *Radar photography, Earth resources, Photointerpretation.

For abstract, see STAR 08 21.
N70-38892 HC$3.00 MF$0.65

GEOLOGICAL EVALUATION OF RADAR IMAGERY - SAN ANDREAS FAULT ZONE FROM STEVENS CREEK, SANTA CLARA COUNTY TO MUSSEL ROCK, SAN MATEO COUNTY, CALIFORNIA.
Geological Survey, Menlo Park, Calif.
R. D. Brown, Jr.. Aug 66, 15p NASA-CR-77610
NASA ORDER R-09-020-015
Seri- Its Tech. Letter Nasa-45

Descriptors: *Aerial photography, *California, *Geology, *Radar photography, *Side-looking radar, Photointerpretation.

For abstract, see STAR 08 21.
N70-38893 HC$3.00 MF$0.65

GEOLOGICAL EVALUATION OF K-BAND RADAR IMAGERY, NORTH-CENTRAL NEVADA.
Geological Survey, Menlo Park, Calif.
R. J. Roberts. Aug 66, 15p NASA-CR-77609
NASA ORDER R-09-020-015
Seri- Its Tech. Letter Nasa-49

Descriptors: *Aerial photography, *Radar photography, Earth resources, Geology, Nevada, Photointerpretation.

For abstract, see STAR 08 21.
N70-38894 HC$3.00 MF$0.65

APPLICATION OF RADAR IMAGERY TO A GEOLOGIC PROBLEM AT GLACIER PEAK VOLCANO, WASHINGTON.
Geological Survey, Menlo Park, Calif.
R. Tabor. May 66, 4p NASA-CR-113312
NASA ORDER R-09-020-015
Seri- Its Tech. Letter Nasa-26

Descriptors: *Aerial photography, *Radar photography, *Volcanology, *Washington, Photointerpretation.

For abstract, see STAR 08 21.
N70-38896 HC$3.00 MF$0.65

PRELIMINARY GEOLOGIC MAP OF THE MONO CRATERS QUADRANGLE, CALIFORNIA.
Geological Survey, Menlo Park, Calif.
For primary bibliographic entry see Field 8B.
For abstract, see STAR 08 21.
N70-38897 HC$3.00 MF$0.65

A DISTINCTION BETWEEN BEDROCK AND UNCONSOLIDATED DEPOSITS ON 3-5 MU INFRARED IMAGERY OF THE YELLOWSTONE RHYOLITE PLATEAU.
Geological Survey, Denver, Colo.
R. L. Christiansen. May 68, 8p NASA-CR-94415, NASA-104
NASA ORDER R-09-020-015

Descriptors: *Infrared photography, *Photointerpretation, *Plateaus, *Rocks, Idaho, Images, Montana, Remote sensors, Wyoming.

For abstract, see STAR 08 21.
N70-38926 HC$3.00 MF$0.65

EVALUATION OF NIMBUS VIDICON PHOTOGRAPHY - SOUTHWEST FRANCE AND NORTHEAST SPAIN.
Geological Survey, Washington, D. C.
E. G. Hasser. Oct 66, 16p NASA-CR-78781
NASA ORDER R-09-020-011
Seri- Its Tech. Letter Nasa-53

Descriptors: *Aerial photography, *France, *Geology, *Satellite observation, *Spain, *Terrain analysis, Earth resources program, Imaging techniques, Nimbus satellites, Vidicons.

For abstract, see STAR 08 21.
N70-38933 HC$3.00 MF$0.65

GEOLOGICAL EVALUATION OF NIMBUS VIDICON MAGERY - NORTHWEST GREENLAND.
Geological Survey, Washington, D. C.
W. E. Davies. Oct 66, 15p NASA-CR-78776
NASA ORDER R-09-020-011
Seri- Its Tech. Letter No. Nasa-56

Descriptors: *Aerial photography, *Geology, *Greenland, *Satellite observation, *Terrain analysis, Earth resources program, Imaging techniques, Nimbus satellites, Vidicons.

For abstract, see STAR 08 21.
N70-38934 HC$3.00 MF$0.65

GEOLOGICAL EVALUATION OF RADAR IMAGERY, APPALACHIAN PIEDMONT, HARFORD AND YORK COUNTIES, MARYLAND AND PENNSYLVANIA.
Geological Survey, Washington, D. C.
D. L. Southwick. Oct 66, 15p NASA-CR-78778
NASA ORDER R-09-020-015
Seri- Its Tech. Letter No. Nasa-48

Descriptors: *Geology, *Maryland, *Pennsylvania, *Radar photography, *Terrain analysis, Aerial photography, Earth resources program, Imaging techniques, Radar maps.

For abstract, see STAR 08 21.
N70-38935 HC$3.00 MF$0.65

PHOTOGEOLOGIC INTERPRETATION OF GEMINI 4 COLOR PHOTOGRAPHY - BAJA, CALIFORNIA.
Geological Survey, Menlo Park, Calif.
R. Tabor. May 66, 7p NASA-CR-75447
NASA ORDER R-09-020-015
Seri- Its Tech. Letter Nasa-24

Descriptors: *California, *Color photography, *Gemini 4 flight, *Geology, *Terrain analysis, Aerial photography, Earth resources, Mapping.

For abstract, see STAR 08 21.
N70-38936 HC$3.00 MF$0.65

RADAR IMAGERY - SALTON SEA AREA, CALIFORNIA.
Geological Survey, Menlo Park, Calif.
E. W. Wolfe. May 66, 16p NASA-CR-75452
NASA ORDER R-09-020-015
Refs Seri- Its Tech. Letter Nasa-29

Descriptors: *California, *Geology, *Radar photography, *Terrain analysis, Aerial photography, Earth resources, Imaging techniques, Radar maps.

For abstract, see STAR 08 21.
N70-38937 HC$3.00 MF$0.65

GEOLOGICAL EVALUATION OF RADAR IMAGERY OF THE SPANISH PEAKS REGION, COLORADO.
Geological Survey, Denver, Colo.
R. B. Johnson. Oct 66, 14p NASA-CR-78779
NASA ORDER R-09-020-015
Refs Seri- Its Tech. Letter No. Nasa-47

Descriptors: *Colorado, *Geology, *Peaks, *Radar photography, *Terrain analysis, Aerial photography, Earth resources program, Imaging techniques, Radar maps.

For abstract, see STAR 08 21.
N70-38938 HC$3.00 MF$0.65

INFRARED IMAGERY OF PART OF THE HIGH CASCADE RANGE AND MC KENZIE RIVER VALLEY, OREGON.
Geological Survey, Menlo Park, Calif.
D. A. Swanson. Jun 67, 21p NASA-CR-85276
NASA ORDER R-09-020-015
Seri- Its Tech. Letter Nasa-76

Descriptors: *Aerial photography, *Geology, *Infrared photography, *Oregon, Basalt, Photointerpretation.

For abstract, see STAR 08 21.
N70-38939 HC$3.00 MF$0.65

A MILLIMETER WAVELENGTH INTERFEROMETER SPECTROMETER FINAL REPORT.
Block Engineering, Inc., Cambridge, Mass.
For primary bibliographic entry see Field 14B.
For abstract, see STAR 08 21.
N70-38940 HC$3.00 MF$0.65

GEOLOGIC EVALUATION OF INFRARED IMAGERY OF HIGHLY FAULTED VOLCANIC TERRANE IN SOUTHEAST OREGON.
Geological Survey, Menlo Park, Calif.
G. W. Walker. Jun 67, 19p NASA-CR-85272
NASA ORDER R-09-020-015
Seri- Its Tech. Letter Nasa-77

Descriptors: *Aerial photography, *Geological faults, *Infrared photography, *Oregon, Photointerpretation, Volcanology.

For abstract, see STAR 08 21.
N70-38941 HC$3.00 MF$0.65

RADAR IMAGERY - PARMACHENEE LAKE AREA, WEST CENTRAL MAINE.
Geological Survey, Washington, D. C.
D. S. Harwood. Jun 67, 16p NASA-CR-85279
NASA ORDER R-09-020-015
Seri- Its Tech. Letter Nasa-81

Descriptors: *Aerial photography, *Geology, *Maine, *Radar photography, Photointerpretation, Rocks, Topography, Trees.

For abstract, see STAR 08 21.
N70-38942 HC$3.00 MF$0.65

GEOLOGIC EVALUATION OF RADAR IMAGERY OF THE CENTRAL PART OF THE OREGON HIGH CASCADE RANGE.
Geological Survey, Menlo Park, Calif.
D. A. Swanson. May 66, 19p NASA-CR-76691
NASA ORDER R-09-020-015

Descriptors: *Aerial photography, *Geology, *Oregon, *Radar photography, Photointerpretation, Topography.

For abstract, see STAR 08 21.
N70-38943 HC$3.00 MF$0.65

ULTRAVIOLET ABSORPTION AND LUMINESCENCE INVESTIGATIONS.
Geological Survey, Washington, D. C.
S. U. Carnahan, and W. R. Hemphill. 16 Aug 65, 71p NASA-CR-68748
NASA ORDER R-146
Seri- Its Tech. Letter Nasa-6

Descriptors: *Luminescence, *Minerals, *Rocks, *Ultraviolet absorption, *Ultraviolet photometry, Aerial photography, Geology.

For abstract, see STAR 08 21.
N70-38944 HC$3.00 MF$0.65

GEOLOGICAL STUDIES OF THE EARTH AND PLANETARY SURFACES OF ULTRAVIOLET ABSORPTION AND SIMULATED LUMINESCENCE.
Geological Survey, Washington, D. C.
W. R. Hemphill, and R. Vickers. Apr 66, 70p
NASA-CR-75909
NASA ORDER R-146-09-020-006
Seri- Its Tech. Letter Nasa Suppl-33a

Descriptors: *Geology, *Minerals, *Rocks, *Spectral reflectance, *Ultraviolet reflection, Earth resources, Earth surface, Luminescence, Planetary surfaces, Ultraviolet absorption.

For abstract, see STAR 08 21.
N70-38945 HC$3.00 MF$0.65

EXTENT OF RELICT SOILS REVEALED BY GEMINI 4 PHOTOGRAPHS.
Geological Survey, Denver, Colo.
H. Drewes, and R. Morrison. Oct 66, 19p NASA-CR-78775
NASA ORDER R-09-020-011
Seri- Its Tech. Letter Nasa-60

Descriptors: *Color photography, *Gemini 4 flight, *Soil mapping, Earth resources, Geochronology, Soil science, Spaceborne photography, Synoptic measurement.

For abstract, see STAR 08 21.
N70-38974 HC$3.00 MF$0.65

AN EVALUATION OF THE GEMINI 4 COLOR PHOTOS OF THE GULF OF CALIFORNIA-CENTRAL TEXAS AREA.
Geological Survey, Denver, Colo.
H. Drewes. Oct 66, 17p NASA-CR-78774
NASA ORDER R-09-020-013
Seri- Its Tech. Letter Nasa-46

Descriptors: *Color photography, *Gemini 4 flight, *Soil mapping, California, Earth resources, Geomorphology, Spaceborne photography, Texas.

For abstract, see STAR 08 21.
N70-38975 HC$3.00 MF$0.65

PREDICTION OF COAL GRINDABILITY FROM EXPLORATION DATA.
Rept. of investigations,
Bureau of Mines, Washington, D.C.
Manuel Gomez, and Kathleen Hazen. Aug 70, 38p RI-7421

Descriptors: (*Bituminous coal, Grindability), Mathematical models, Indexes (Ratios), Petrography, Microstructure, Mechanical properties, Drill core analysis, Exploration, Tables.

A general prediction model for the Hardgrove grindability index was constructed from 735 coal samples using the proximate analysis, heating value, and sulfur content. The coals used to develop the general model ranged in volatile matter from 12.8 to 49.2 percent, dry basis, and had grindability indexes ranging from 35 to 121. A restricted model applicable to bituminous coals having grindabilities in the 40 to 110 range was

developed from the proximate analysis and the petrographic composition of the coal. The prediction of coal grindability within a single seam was also investigated. The results reported support the belief that mechanical properties of the coal are related to both chemical and petrographic factors of the coal. The mechanical properties of coal may be forecast in advance of mining because the variables used as input to the prediction models can be measured from drill core samples collected during exploration. (Author)
PB-194 941 HC$3.00 MF$0.65

INVESTIGATION OF A LOW-GRADE GOLD DEPOSIT IN THE OROGRANDE DISTRICT, IDAHO.
Rept. of investigations,
Bureau of Mines, Washington, D.C.
William L. Rice. Sep 70, 18p RI-7425

Descriptors: (*Precious metal ores, Idaho), (*Gold, Deposits), Soils, Softwoods, Atomic spectroscopy, Sampling, Site surveys, Planning, Silver, Metamorphic rocks, Igneous rocks, Maps.
Identifiers: Orogrande District (Idaho), Low grade deposits.

Geochemical humus sampling techniques were used by the Bureau of Mines in investigating a potential large, low-grade gold deposit in the Orogrande district, Idaho. Conifer needle humus samples were processed by ashing and fire assay-atomic absorption analysis. An area bearing anomalous concentrations of gold and silver was outlined by the geochemical method. (Author)
PB-194 944 HC$3.00 MF$0.65

PRODUCTION POTENTIAL OF COPPER DEPOSITS ASSOCIATED WITH PERMIAN RED BED FORMATIONS IN TEXAS, OKLAHOMA, AND KANSAS.
Rept. of investigations,
Bureau of Mines, Washington, D.C.
R. B. Stroud, A. B. McMahan, R. K. Stroup, and M. H. Hibpshman. Aug 70, 108p RI-7422

Descriptors: (*Copper ore deposits, Strip mining), Drilling, Economic geology, Sampling, Cost analysis, Milling (Machining), Stratigraphy, Coring, Texas, Oklahoma, Kansas.
Identifiers: Permian red bed formations.

Bureau of Mines studies of copper-bearing Permian red beds, which extend from north-central Texas through western Oklahoma to southwestern Kansas, indicate heretofore underfined commercial possibilities for low-grade, medium-volume strip-mining operations. Potential ore bodies are indicated containing 0.5 to 1.5 percent copper in zones 6 to 12 inches thick. Cost analysis studies indicate a commercial operation is feasible for a hypothecated 1,000-ton-per-day ore mining and milling complex where a maximum of 60 feet of over-burden can be stripped in mining a seam of shale 12 inches thick containing 1.2 percent copper. (Author)
PB-194 947 HC$3.00 MF$0.65

CENTRAL NEW YORK REGION TOPOGRAPHY.
Central New York Regional Planning and Development Board, Syracuse.
For primary bibliographic entry see Field 13B.
PB-195 009 HC$3.00 MF$0.65

STATIC DETERMINATION OF THE DEFORMATIONAL PROPERTIES OF SOLID MATERIALS WITH PRESSURE,
California Univ., Livermore. Lawrence Radiation Lab.
For primary bibliographic entry see Field 14B.
For abstract, see NSA 24 20.
UCRL-50852 HC$3.00 MF$0.65

HYDRAULIC TESTING OF WELL HTH-23 IN CENTRAL NEVADA,
Geological Survey, Denver, Colo.
George A. Dinwiddie. Jun 70, 34p

Descriptors: (*Exploratory wells, Formation tests), (*Nuclear engineering, Underground explosions), (*Ground water, Nuclear radiation), Reservoir performance, Water drive.
Identifiers: *Hydraulic tests.

For abstract, see NSA 24 20.
USGS-474-23 HC$3.00 MF$0.65

HYDRAULIC TESTING AND SAMPLING OF HOLE Ue-1, IN CENTRAL NEVADA.
Geological Survey, Denver, Colo.
George A. Dinwiddie. Jun 70, 25p Central Nevada-7
Contract AT (29-2)-474

Descriptors: (*Exploratory wells, Formation tests), (*Nuclear engineering, Underground explosions), (*Ground water, Nuclear radiation), Resevoir performance, Water drive.
Identifiers: Hydraulic tests.

For abstract, see NSA 24 20.
USGS-474-77 HC$3.00 MF$0.65

8H. Hydrology and Limnology

SAND WAVES AND TIDAL CHANNELS IN THE ENTRANCE TO CHESAPEAKE BAY.
Technical rept.,
Old Dominion Univ Norfolk Va Inst of Oceanography
John C. Ludwick. 15 Sep 70, 96p Rept no. TR-1
Contract N00014-70-C-0083

Descriptors: (*Estuaries, Sand), (*Tides, Chesapeake Bay), Sedimentation, Floods, Ocean waves, Fluid flow, Interactions, Hydrographic surveying, Bathythermograph data.
Identifiers: Tidal channels, Shoal development.

Sand waves 5-12 feet in height and 200-1200 feet in length occur in water 25-50 feet deep in the sand bank and tidal channel area of the entrance to Chesapeake Bay. Most waves are asymmetrical in transverse profile, some facing with ebb currents, others facing with flood currents, depending which is dominant at a given place. Steep slopes on the various waves range from 4 to 31 degrees and average 12 degrees. The sand waves occur in association with tidal channels and especially on the flanks of shoals that form channel boundaries. Migration of sand waves, judged from their facing direction, is a bed sediment transport mechanism by which sand is moved up onto shoals. Many large shoals of the area occur between ebb-dominated and flood-dominated channels. This implies the existence of net circulation loops of water and sediment in cells located over shoals. The action of such cells is to trap sediment. Other ebb-flood shear zones may mark sites of future shoaling in the entrance. (Author)
AD-713 195 HC$3.00 MF$0.65

SOME FEATURES OF WIND WAVES IN LAKE MICHIGAN.
Miscellaneous paper,
United States Lake Survey Detroit Mich
Paul C. Liu. 1970, 17p Rept no. MP-70-3
Availability: Pub. in Limnology and Oceanography, v15 n2 p257-272 Mar 70.

Descriptors: (*Lake waves, *Great Lakes), Mathematical models, Power spectra, Mathematical prediction, Anemometers, Drag, Water waves.
Identifiers: Lake Michigan, Spectrum analysis.

Sets of simultaneous data of wind profiles and surface waves recorded in Lake Michigan during fall 1965 facilitated a detailed study of generation and decay aspects of wind waves. A logarithmic wind profile, fitted to data measured simultaneously at 3 or 4 anemometer heights, appears to be satisfactory. From the parameters of frictional wind velocity and roughness element computed from the logarithmic wind profile, the spectral growth of waves according to recently developed theoretical models of wave generation was predicted. The energy spectra of measured waves indicate that wave energy growth rate is, as predicted, exponential with respect to time but is 8 times larger than the predicted rate. The decay of wave spectra at a single location was qualitatively examined. The peak frequency either increased or remained constant for decreasing spectral energy. The similarity in behavior of wave spectra was demonstrated through normalization which resulted in an empirical equation for wave spectra. The measured equilibrium range in the high-frequency region of the spectra follows the (1/f to the 5th power) rule. (Author)
AD-713 329

PRELIMINARY REVIEW AND ANALYSIS OF FLOOD CONTROL PROJECT EVALUATION PROCEDURES.
Final rept.,
Intasa Menlo Park Calif
N. V. Arvanitidis, R. L. Lind, J. Rosing, and G. P. Johnson. Sep 70, 131p Rept no. IRR-70-01 IWR-70-3
Contract DACW07-70-C-0050

Descriptors: (*Floods, Control), Protection, Damage, Management planning, Simulation, Costs, Terrain, Law, Maintenance, Economics, Statistical analysis, Reviews.
Identifiers: *Flood control, Flood plain management, Land enhancement.

The study clarifies the economic consequences and effects of programs designed to protect or otherwise manage flood plains. A firm basis is established to appropriately distinguish between the source of change of a flood plain development from its economic effects. The study makes the following major findings: Where the development in the flood plain will be the same with and without the project, benefits attributable to the project will equal total damages reduced. Where there is project induced growth, the benefits attributable to the project are equal to the net increase in productivity of the economy due to the relocation of activities both inside and outside the flood plain. Benefits from project induced growth (so-called 'land enhancement' benefits) can be measured by the difference between the net income (profits) of activities which move into the flood plain with protection and the net income they could earn outside the flood plain. In the absence of direct observation of change in net income, benefits from project induced growth can be measured in terms of simulating damages reduced to new activities that would locate in the flood plain with protection. (Author)
AD-713 482 HC$3.00 MF$0.65

ELECTRICAL CONDUCTIVITY MEASUREMENTS IN THE THAMES RIVER: NEW LONDON TO NORWICH, CONNECTICUT.
Technical memo.,
Navy Underwater Sound Lab New London Conn
Emil F. Soderberg. 1 Apr 68, 17p Rept no. USL-TM-2121-17-68

Descriptors: (*Rivers, Electrical conductance), Salinity, Temperature, Connecticut.
Identifiers: Thames River (Connecticut).

In April 1967, measurements were made in the Thames River to get an idea of what the salt wedge looked like and what values of electrical conductivity and temperature would be encountered at various points in the river. Scattered data were obtained on several days, but the data reported here for one day represent the only complete set of profile measurements made between Southwest Ledge and Norwich. (Author)
AD-713 494 HC$3.00 MF$0.65

ESTUARINE VERSION OF THE COLHEAT DIGITAL SIMULATION MODEL,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
D. G. Daniels, J. C. Sonnichsen, and R. T. Jaske.
Jun 70, 53p*
Contract AT (45-1)-1830

Descriptors: (*Water pollution, *Heat), (*Nuclear power plants, Water pollution), (*Estuaries, Heat), Rivers, Tidewater, Stream flow, Ecology, Computerized simulation, Cooling water.
Identifiers: *Thermal pollution, *COLHEAT computer program, *Columbia River.

For abstract, see NSA 24 20.
BNWL-1342 HC$3.00 MF$0.65

HYDROLOGIC EVALUATION OF GEMINI PHOTOGRAPHS OF FRINGES OF THE SAHARA, AFRICA.
Geological Survey, Washington, D. C.
J. R. Jones. Apr 67, 16p NASA-CR-84588
NASA ORDER R-09-020-013
Seri- Its Tech. Letter Nasa-68

Descriptors: *Africa, *Gemini flights, *Hydrology, *Spaceborne photography, Earth resources, Photointerpretation, Terrain analysis, Topography.

For abstract, see STAR 08 21.
N70-38929 HC$3.00 MF$0.65

SOME DATA CONCERNING THE BOTTOM TEMPERATURES OF THE FYBINSKO RESERVOIR IN THE PERIOD WHEN THE RESERVOIR IS COVERED BY ICE,
Oak Ridge National Lab., Tenn.
S. S. Bakastov. 1970, 7p
Trans. of Akademiya Nauk SSSR. Institut Biologii Vnutrennykh Vod. Byulleten, n8/9 p62-66 1960.

Descriptors: (*Hydrology, USSR), (*Reservoirs, Temperature measurement), Ice, Sedimentation, Fluid flow, Stagnation point, Translations.

For abstract, see NSA 24 20.
ORNL-tr-2351 HC$3.00 MF$0.65

DISSOLVED OXYGEN RESOURCES AND WASTE ASSIMILATIVE CAPACITY OF THE LA GRANGE POOL, ILLINOIS RIVER.
Illinois State Water Survey, Urbana.
For primary bibliographic entry see Field 13B.
PB-194 873 HC$3.00 MF$0.65

PREDICTION OF MOISTURE MOVEMENT IN EXPANSIVE CLAYS.
Research rept.,
Texas Univ., Austin. Center for Highway Research.
Robert L. Lytton, and Ramesh K. Kher. May 70, 266p RR-118-3
Report on Study of Expansive Clays IN Roadway Structural Systems. Prepared in cooperation with Bureau of Public Roads, Washington, D.C.

Descriptors: (*Clays, Soil water), (*Soil water, Motion), (*Partial differential equations, *Numerical integration), Computer programs, Foundations, Roads, Mathematical prediction, Permeability, Bridge foundations.
Identifiers: GCHPIP1 computer program, Crank-Nicolson method, FLOPIP2 computer program.

The report describes two computer programs for determining changing moisture distribution with time. Program FLOPIP1 is arranged to work one-dimensional problems and computer Program GCHPIP1 solves moisture distribution problems in two dimensions. The equation governing the flow of moisture is a concentration-dependent, parabolic, partial differential equation which is solved numerically using the implicit Crank-Nicholson method of marching forward in time. Example problems are worked to demonstrate the capabilities and breadth of application of the computer programs and to prove the validity of the approach. The one-dimensional example problems are concerned with matching measured field data and with presenting the results of a parameter study of various suction and permeability factors. The field data can be duplicated to within very close tolerances. The two-dimensional example problems are arranged to demonstrate the versatility of computer Program GCHPIP1. Problems solved include a two-dimensional consolidation problem, ponding problems, and a problem of predicting moisture distribution within a concrete highway bridge girder. (BPR Abstract).
PB-194 910 HC$3.00 MF$0.65

BEDLOAD FORMULAS. PART A. A SELECTION OF BEDLOAD FORMULAS. PART B. PROGRAM LISTINGS FOR BEDLOAD FORMULAS.
Final rept.,
Pennsylvania State Univ., University Park. Dept. of Civil Engineering.
Sam Shulits, and Ralph D. Hill, Jr. Dec 68, 222p
ARS-SWC-1
Contract AG-12-14-1000-8872 (41)

Descriptors: (*Bed load, Mathematical models), (*Channels (Waterways), Sediment transport), Channel flow, Erosion, FORTRAN, Computer programs.

Formulas for computing bedload are reviewed, and FORTRAN program listings are given for digital computer solution of 14 of them. The programs are for the formulas of Schoklitsch, Meyer-Peter, Casey, Haywood, Straub, Waterways Experiment Station, Shields, Kalinske, Meyer-Peter and Muller, Eizerman and Frijlink, Laursen, Rottner, and Einstein. Results of the formulas are compared by calculating and plotting sediment discharge against water discharge for all of them. Each formula is presented in its original form and units, and its use is explained as the originator intended. (Author)
PB-194 950 HC$3.00 MF$0.65

EROSION AND SEDIMENTATION FOLLOWING ROAD CONSTRUCTION AND TIMBER HARVEST ON UNSTABLE SOILS IN THREE SMALL WESTERN OREGON WATERSHEDS.
Pacific Northwest Forest and Range Experiment Station, Portland, Oreg.
For primary bibliographic entry see Field 2F.
PB-194 987 MF$0.65

DEFORMATION OF DRAINS BECAUSE OF SUBSIDENCE OF PEATS AFTER DRAINAGE,
National Tillage Machinery Lab., Auburn, Ala.
For primary bibliographic entry see Field 13K.
PB-195 000T HC$3.00 MF$0.65

STABILITY AND DURABILITY OF PLASTIC DRAINS,
National Tillage Machinery Lab., Auburn, Ala.
For primary bibliographic entry see Field 13K.
PB-195 001T HC$3.00 MF$0.65

THE 1966 GUERNSEY RESERVOIR SEDIMENT SURVEY,
Bureau of Reclamation, Denver, Colo. Office of Chief Engineer.
Joe M. Lara. Jul 70, 56p REC-OCE-70-22

Descriptors: (*Reservoir engineering, Sedimentation), (*Sediments, Accumulation), Volume, Hydrographic surveys, Sediment transport, Gamma ray spectroscopy, Clays, Silts, Sands, Degradation, Sampling, Maps, Wyoming.
Identifiers: Guernsey Reservoir.

The 1966 sediment survey of Guernsey Reservoir was made to determine the present reservoir capacity and the quantity of sediment accumulated since the dam was closed in 1927. Present capacity of the reservoir is 45,228 acre-ft and the surface area is 2,377 acres at normal water surface elevation 4420 ft. The total volume of sediments accumulated in the reservoir amounted to 28,582 acre-ft below elevation 4420 ft. Sediments accumulated at an annual rate of 719 acre-ft between 1927 and 1966. Twenty-one sediment samples of reservoir deposits were collected and a gamma probe was used to measure we bulk densities of these deposits at 20 reservoir ranges. Analyses of samples collected in 1947, 1957, and 1966 showed an average unit weight of 54 lb/cu ft. Size analyses of samples collected during the 3 surveys resulted in an average breakdown of 43% clay, 44% silt, and 13% sand. A sonic depth recorder was used to make the hydrographic survey. The reservoir capacity was computed on the basis of areas determined by a width ratio method. (Author)
PB-195 013 HC$3.00 MF$0.65

THICKNESS OF SOIL SOLUM AS A PARAMETER OF PLANTAVAILABLE WATER STORAGE CAPACITY IN SOILS UNDERLAIN BY CARBONATE ROCKS.
Completion rept. Jul 68-Dec 69,
Missouri Water Resources Research Center, Columbia.
C. L. Scrivner, and D. A. Ruppert. 10 Aug 70, 122p W71-00414, OWRR-B-022-MO (2)
Contract DI-14-01-001-1917

Descriptors: (*Soil water, Measurement), Plants (Botany), Water storage, Limestone, Radiation measurement systems, Thickness, Vegetation, Forest treees.

Available water storage capacities were determined by field measurement in limestone-derived soils with a range in depths to carbonate rock of 15 cm to more than 300 cm. Neutron probe access wells were installed and amounts of water were determined throughout two growing seasons. Each soil layer had a characteristic volume of water (called observed field capacity) after recharge by rain periods. At maximum depletions, water approached 15 bar contents. Equations were developed for the prediction of available water (the volume difference between observed field capacity and 15 bar water) from three soil variables; clay content, chert-stone content and depth to carbonate rock. When effects of chert and clay were accounted for the prediction equation was: Total A. W.C.= 0.11 (cm depth - 102). Depths to limestone of less than 61 cm (67 cm A.W.C.) were too shallow to support forest canopies and the natural vegetation was prairie. Forest species survived where depths were greater than 61 cm and some depletion was observed at greater than 250 cm depth. (Author)
PB-195 085 HC$3.00 MF$0.65

REMOTE SENSING FOR RESOURCE MANAGEMENT AND FLOOD PLAIN DELINEATION,
Wisconsin Univ., Madison. Dept. of Soil Science.
Clarence J. Milfred, Dale E. Parker, and Gerhard B. Lee. 1970, 18p W71-00415, OWRR-B-002-WIS (11)
Presented at Midwestern States Flood Control and Water Resources Conference (24th) Milwaukee, Wis., 21-22 May 69.

Descriptors: (*Water resources, *Remote sensing), (*Flood plains, Remote sensing), (*Sensor mapping, Flood plains), Zoning, Planning, Aerial Photography, Soil surveys, Photogrammetry, Photointerpretation, Side looking radar, Infrared detection.
Identifiers: *Multiband photographys, Multispectrial sensors.

Remote sensing is becoming an extremely important research tool in modern resource management techniques. Water resource managers can use remote sensing systems to provide supplmental in-

formation in regions where planning has been hampered by the lack of suitable hydrologic data and other resource information. Continued pressure for encroachment and development on flood plains will generate a need for more comprehensive planning based on timely and accurate information about an entire river basin or watershed. With respect to flood plain delineation, remote sensors cannot be used to predict the height of future floods. They can provide information to indicate areas that have flooded which should help improve flood predictions based on theoretical models. Remote sensors offer a dynamic resource inventory system which can be used to complement traditional detailed studies and serve as an important source of information in regions where detailed studies are not available. Remote sensors generate a great deal of data and there is danger of accumulating more information than can be utilized. This problem can be largely overcome by maintaining a close working relationship between scientists working on applications of the sensors and resource managers who will use the information to help solve important natural resource problems. (Author)
PB-195 086 HC$3.00 MF$0.65

HYDRAULIC GEOMETRY OF 12 SELECTED STREAM SYSTEMS OF THE UNITED STATES.
Final rept. 1 Jul 68-30 Jun 70,
Illinois Univ., Urbana. Water Resources Center.
John B. Stall, and Chih Ted Yang. Jul 70, 73p
WRC-RR-32 W71-00472
See also Rept. no. PB-179 446.

Descriptors: (*Hydrology, *Illinois), (*Stream flow, Measurement), Rivers, Drainage, Mapping, Biochemical oxygen demand, Runoff, Planning, Site surveys, Statistical analysis.
Identifiers: Hydraulic geometry.

A completed project shows there to be, for the 18 river basins in Illinois, a consistent pattern in which the width, depth, and velocity of flow in a stream change along the course of the stream, with a constant frequency of discharge. These channel characteristics are termed hydraulic geometry and constitute an interdependent system which can be described by a series of graphs having simple form, or by equations. The data from about 250 stream gaging stations will be assembled and used to develop the parameters to define the hydraulic geometry of stream systems for ten river basins selected to represent various physiographic and hydrologic regions of the humid part of the United States. These parameters are to be generalized for various physiographic divisions and used to help explain variability of other observed hydrologic phenomena such as low flow frequency, and flow-duration. These parameters will also be used to predict the average depth and velocity of flow at problem locations on the stream where no measurements are available. This will allow computation of the re-oxygenation capacity of the stream at a problem location, and the time-of-travel of contaminants through the stream system. (WRSIC abstract)
PB-195 165 HC$3.00 MF$0.65

NUCLEAR MEASUREMENT OF SOIL PROPERTIES.
Virginia Highway Research Council, Charlottesville.
For primary bibliographic entry see Field 8M.
PB-195 182 HC$3.00 MF$0.65

THE INTERRELATION OF CARBON AND PHOSPHORUS IN REGULATING HETEROTROPHIC AND AUTOTROPHIC POPULATIONS IN AQUATIC ECOSYSTEMS.
Federal Water Quality Administration, Athens, Ga. National Pollutants Fate Research Program.
For primary bibliographic entry see Field 6F.
PB-195 195 MF$0.65

FACTORS AFFECTING THE TRANSFER OF MATERIALS BETWEEN WATER AND SEDIMENTS.
Literature review no. 1,
Wisconsin Univ., Madison. Water Resources Center.
G. Fred Lee. Jul 70, 54p W71-00618, OWRR-W-117 (1614) (1)
Supported in part by Soap and Detergent Association and Department of Agriculture, Washington, D.C.

Descriptors: (*Lakes, Sediments), (*Sediments, *Water chemistry), Hydrodynamics, Exchange reactions, Chemical properties, Precipitation (Chemistry), Oxidation reduction reactions, Phosphorus inorganic acids, Buffers (Chemistry), Nitrogen, Reviews.
Identifiers: Eutrophication.

A general description of the possible factors involved in various kinds of exchange reactions between waters and sediments is presented. Basically, the exchange reactions have been broken down into physical control, where hydrodynamics plays the important role in determining the rate of exchange, and biological and chemical control where the processes bringing the material onto or from the surface of the solid are the major function. Knowledge of exchange reactions and the factors influencing them appears to be extremely meager. In fact, it is almost impossible to make any predictions about the magnitude or rate of exchange for any species in a system that has not been investigated. Hopefully, current research in this area will help to eliminate this deficiency in knowledge within a few years. (Author)
PB-195 220 HC$3.00 MF$0.65

COLUMBIA RIVER EFFECTS IN THE NORTHEAST PACIFIC.
Progress rept. Jun 69-Jun 70,
Washington Univ., Seattle. Dept. of Oceanography.
Clifford A. Barnes. 10 Jul 70, 47p
Contract AT (45-1)-1725

Descriptors: (*Rivers, Interactions), (*Oceanographic data, Pacific Ocean), Continental shelves, Ocean currents, Hydrographic surveys, Coasts, Phytoplankton, Sediments, Silicon dioxide, Chlorophylls, Benthos.
Identifiers: Columbia River.

For abstract, see NSA 24 20.
RLO-1725-180 HC$3.00 MF$0.65

HYDRAULIC TESTING OF WELL HTH-23 IN CENTRAL NEVADA,
Geological Survey, Denver, Colo.
For primary bibliographic entry see Field 8G.
For abstract, see NSA 24 20.
USGS-474-23 HC$3.00 MF$0.65

HYDRAULIC TESTING AND SAMPLING OF HOLE Ue-1, IN CENTRAL NEVADA.
Geological Survey, Denver, Colo.
For primary bibliographic entry see Field 8G.
For abstract, see NSA 24 20.
USGS-474-77 HC$3.00 MF$0.65

8I. Mining Engineering

CALCULATION PROCEDURE FOR HEAT TRANSFER TO A GAS-SOLID SUSPENSION FROM AN EXTERNALLY HEATED TUBE.
Bureau of Mines, Washington, D.C.
For primary bibliographic entry see Field 20M.
PB-194 938 HC$3.00 MF$0.65

ROCK FRAGMENTATION BY CREATING A THERMAL INCLUSION WITH DIELECTRIC HEATING.
Rept. of investigations,
Bureau of Mines, Washington, D.C.
K. Thirumalai. Sep 70, 38p* RI-7424

Descriptors: (*Rock excavation, Dielectric heating), (*Rocks, Fragmentation), Thermal stresses, Fractures (Materials), Granite, Basalt, Quartzites, Tensile strength, Shear stress, Electrical resistivity, Elastic theory, Mining engineering.

The potential of internal heating techniques for rock fragmentation is discussed. A concept of rock fragmentation with rapid internal heating of a localized inner volume of rock is advanced. The fragmentation of rock using the proposed method is analyzed and qualitatively compared with the results of experiments with charcoal granite, basalt, and quartzite. High frequency dielectric heating below 100 MHz is used in the study as an example to examine the working of the concept. The method offers a possibility for in situ fragmentation of rocks, favorable for internal heating. The method is highly dependent on rock properties governing internal heat generation. The efficiency of dielectric heating in the experimental study is observed to increase with increasing dielectric loss of the rock material, ranging from about 10 percent in quartzite to about 50 percent in basalt. (Author)
PB-194 943 HC$3.00 MF$0.65

INVESTIGATION OF A LOW-GRADE GOLD DEPOSIT IN THE OROGRANDE DISTRICT, IDAHO.
Bureau of Mines, Washington, D.C.
For primary bibliographic entry see Field 8G.
PB-194 944 HC$3.00 MF$0.65

PRODUCTION POTENTIAL OF COPPER DEPOSITS ASSOCIATED WITH PERMIAN RED BED FORMATIONS IN TEXAS, OKLAHOMA, AND KANSAS.
Bureau of Mines, Washington, D.C.
For primary bibliographic entry see Field 8G.
PB-194 947 HC$3.00 MF$0.65

METHANE EMISSION RATE STUDIES IN A NORTHERN WEST VIRGINIA MINE.
Technical progress rept. no. 28,
Bureau of Mines, Washington, D.C.
Stephen Krickovic, Charles Findlay, and W. M. Merritts. Aug 70, 15p
Report on Methane Control Program.

Descriptors: (*Mine gases, Methane), (*Coal mining, *Methane), Safety, Mine ventilation, Gas detectors, Gas flow.
Identifiers: *Mine safety.

Methane emission rates were studied in a Pittsburgh coalbed mine in northern West Virginia. A fullface boring-type continuous miner, equipped with a methane monitor, was used in the development of a set of eight main headings, one side of which was near old workings; the other side abutted virgin coal. Two air splits ventilated the section. Air volumes and methane percentages were recorded, and time studies of the miner were made during five consecutive operating days, during which a complete cycle of mining the headings and one line of related breakthroughs was accomplished. Methane emission rates increased significantly as mining progressed from the side near old mine workings toward the virgin area, and generally increased with coal extraction. Mining in the heading immediately adjacent to virgin coal was interrupted quite frequently, owing to excessive methane concentrations at the face, despite adequate air volumes and acceptable methane concentrations in the immediate return airway. (Author)
PB-194 949 HC$3.00 MF$0.65

MANPOWER AND TECHNOLOGY IN BITUMINOUS COAL MINING: 1956-70.
Research rept.,
Indiana Univ., Bloomington.
C. L. Christenson, and W. H. Andrews. 28 Sep 70, 469p* DLMA-91-16-66-32

Grant DL-91-16-66-32

Descriptors: (*Bituminous coal, Production engineering), (*Coal mining, Manpower), Manpower utilization, Job analysis, Employment, Management engineering, Periodic variations, Analysis of variance, Prices, Fossil fuel deposits, Economic Surveys, Earnings, Hazards, Accident prevention, Consumption, Statistical distributions.
Identifiers: Technological development, *Technolgocial change.

The study analyses changing skill requirements and adjustment problems incident to rapid technological development in the U.S. bituminous coal mining industry and includes discussion of general development of employment and production in the industry; geographical variations in employment, production, and earnings; seasonal and other short-run fluctuations in coal mine employment; technology, industry structure, and accident hazards; and changing technology, industry structure, and labor utilization in relation to consumption patterns. The study also includes a comparison of U.S. and British coal mining experiences. (DOL abstract)
PB-195 004 HC$3.00 MF$0.65

8J. Physical Oceanography

SEDIMENT-CAPPED GUYOTS IN THE MID-PACIFIC MOUNTAINS.
Scripps Institution of Oceanography San Diego Calif Marine Physical Lab
D. E. Karig, M. N. A. Peterson, and G. G. Shor. 2 Jun 69, 7p Rept no. MPL-U-52/69
Contract N00014-69-A-0200-6002, Grant NSF-GA-681
Availability: Pub. in Deep-Sea Research, v17 p373-378 1970.

Descriptors: (*Ocean bottom topography, Pacific Ocean), Sedimentation, Echo ranging, Reflection, Deposits, Erosion, Ocean currents, Thickness, Oceanographic vessels.
Identifiers: Seamounts, Guyots, Submarine terraces, Argo vessel, Horizon vessel, Seismic profiles.

Seismic reflection profiling across several guyots of the Mid-Pacific Mountains has revealed low domes of sediments above the basement summit platform. These domes are asymmetric, reflecting preferential erosion or non-deposition on the northern flanks, and are attributed to the action of deep currents on pelagic sediments deposited on guyots after they subside below wave base. Sets of terraces buried beneath the pelagic capping suggest that guyot subsidence was a complex process. (Author)
AD-713 081

CRUISE REPORT CHAIN CRUISE 98.
Woods Hole Oceanographic Institution Mass
For primary bibliographic entry see Field 8C.
AD-713 105 HC$3.00 MF$0.65

BATHYMETRY PROGRAM KURILE ISLANDS EXPERIMENT.
Special rept. no. 3,
Texas Instruments Inc Dallas Science Services Div
R. F. Howard. 28 Apr 67, 21p
Contract F33657-67-C-0105, ARPA Order-624
Report on Ocean-Bottom Seismographic Experiments. See also Special rept. no. 2, AD-661 288.

Descriptors: (*Bathythermograph data, Pacific Ocean), (*Seismographs, *Pacific Ocean Islands), Seismic waves, Velocity, Epicenter, Microseisms, Underwater equipment, Noise, Ocean bottom, Detection, Calibration, Shallow water, Explosions, Networks, Data processing systems, Oceanographic vessels, Depth indicators.
Identifiers: Kurile Islands, Pacific Seal vessel, Campeche vessel.

A bathymetric survey was conducted as a part of the Kurile Islands Experiment. As the primary efforts of the experiment were directed toward the Ocean-Bottom Seismograph and Explosive Program, the method used during the bathymetric survey was appropriate but not optimum. Bathymetric data were very good and were as reliable as navigation would permit. However, the profile coverage was generally too sparse. The conclusion is that observations of depth values, OBS-environmental relations and overall bathymetry are valid within navigational limits. (Author)
AD-713 126 HC$3.00 MF$0.65

SURFACE CHEMISTRY STUDIES ON THE BAY OF PANAMA.
Memorandum rept.,
Naval Research Lab Washington D C
J. D. Bultman, W. D. Garrett, N. L. Jarvis, and J. B. Romans. Jun 63, 15p Rept no. NRL-MR-1435

Descriptors: (*Sea water, *Surface-active substances), (*Monomolecular films, *Oceans), Interfaces, Chemical analysis.
Identifiers: *Surface chemistry, *Panama Bay.

A field trip was made to the Bay of Panama during the week of April 8 through April 12, 1963. The purpose of the trip was to carry out experiments dealing ultimately with the surface chemistry of the sea. Surface and subsurface water samples were collected to determine the nature of the adsorbed films that occur on the sea and to learn more of their origin. Experiments were also carried out to determine the rate of adsorption of surface active material at the sea/air interface, and to determine force-area curves for the stable film forming constituents. Efforts were also made to measure in a given small area the percent coverage of the sea by surface active material. In addition, measurements were made of the film pressure of slick covered areas, and an attempt was made to correlate these measurements with the changes in surface potential. Each experiment is discussed briefly in this report with appropriate conclusions and recommendations. (Author)
AD-713 142 HC$3.00 MF$0.65

NEAR-BOTTOM STUDIES OF THE EAST PACIFIC RISE CREST AND TECTONICS OF THE MOUTH OF THE GULF OF CALIFORNIA.
Scripps Institution of Oceanography San Diego Calif Marine Physical Lab
Roger Lee Larson. 1 Jul 70, 180p Rept nos. SIO-Ref-70-22, MPL-U-47/70
Contract N00014-69-A-0200-6002, Grant NSF-GA-4581
Report on Deep Submergence Systems Project.

Descriptors: (*Ocean bottom topography, *Pacific Ocean), Bathythermograph data, Magnetic anomaly detection, Earthquakes, Hydrographic surveying, Interactions, Marine geophysics, Sonar, Detection.
Identifiers: *East Pacific Rise Crest, Magnetic anomalies, Plate tectonics, Abyssal hills, Oceanic crust, California Gulf.

Bathymetric and magnetic measurements have been used to delineate the boundary between the North American and Pacific Plates in the vicinity of the mouth of the Gulf of California and indicate a spreading rate of 6 cm/yr. Magnetic anomalies, fracture zones and earthquake mechanisms indicate the validity of the rigid plate assumption for the interactions between the Pacific, American and Cocos plates. A survey with a near-bottom instrument over the East Pacific Rise crest shows lineated abyssal hills with no sediment cover at the rise crest itself. Magnetic field measurements made near the ocean floor show to a certain extent the history of the earth's magnetic field over the last 1.2 million years and show a reversal transition time of 1000 years and intensity fluctuations with periods ranging between 18000 and 50000 years. (Author)
AD-713 165 HC$3.00 MF$0.65

ORIGIN AND STRUCTURE OF THE NEW ENGLAND SEAMOUNT CHAIN.
Technical rept.,
Woods Hole Oceanographic Institution Mass
Elazar Uchupi, J. D. Phillips, and K. E. Prada. 14 Nov 69, 17p Rept nos. WHOI-Ref-70-47, WHOI-Contrib-2374
Contracts N00014-66-C-0241, Nonr-3484 (00)
Sponsored in part by Contract Nonr-4029 (00), Grants NSF-GA-1298, NSF-GA-976, NSF-GS-10875, and NSF-GS-11508.
Availability: Pub. in Deep-Sea Research, v17 p483-494 1970.

Descriptors: (*Ocean bottom topography, Continental shelves), Faults (Geology), Echo ranging, Volcanoes, Basalt, Manganese compounds, Oxides, Magnetic anomaly detection, Geologic age determination, Bathythermograph data, Atlantic Ocean.
Identifiers: *Seamounts, New England, Continental rises, Ocean bottom spreading, Seismic profiles.

The New England Seamount Chain is located along a fracture zone formed by a discontinuity in sea-floor spreading pattern. This discontinuity resulted from either a simple transform fault which opened progressively along its length as it was formed, or the entire fault line opened at one time due to a later change in spreading direction. The opening of the fault may have been initiated during earliest Mesozoic and probably continued to the Cretaceous. Differences in rates and/or duration of spreading on either side of the fault may have caused the offset of a previous continuous basin and ridge system beneath the shelf. (Author)
AD-713 204

ENVIRONMENTAL DATA FROM AN/SMT-1 NOMAD N3S GULF OF MEXICO: PROJECT SEA SENSE.
National Oceanographic Data Center Washington D C
For primary bibliographic entry see Field 4B.
AD-713 479 HC$3.00 MF$0.65

COMPUTER PROGRAMS IN OCEANOGRAPHY.
Catalog series,
National Oceanographic Data Center Washington D C
C. Dinger. 1970, 149p* Rept no. NODC-Pub-C-5-Rev-2
Revision of AD-613 598.
Availability: Paper copy available from National Oceanographic Data Center, Washington, D. C. 20390. Price: $1.35.

Descriptors: (*Oceanographic data, *Programming (Computers)), Marine geophysics, Marine biology, Sea water, Chemical properties, Plankton, Chlorophylls, Statistical analysis, Navigation, Tides, Sea ice, Ocean waves, Surface temperatures, Abstracts, Catalogs.
Identifiers: Air water interactions, Data reduction.

Contents: Program abstracts, by category; Biological oceanography, chemical oceanography, data reduction, editing and special input/output, geoscience, graphical display, mathematics, applied; navigation and charting; physical oceanography; retrieval of ocean data.
AD-713 491 MF$0.65

COOPERATIVE INVESTIGATION OF THE CARIBBEAN AND ADJACENT REGIONS (CICAR). BIBLIOGRAPHY ON METEOROLOGY, CLIMATOLOGY, AND PHYSICAL/CHEMICAL OCEANOGRAPHY. VOLUME I.
American Meteorological Society Washington D C
For primary bibliographic entry see Field 4B.
AD-713 492 MF$0.65

COOPERATIVE INVESTIGATION OF THE CARIBBEAN AND ADJACENT REGIONS (CICAR). BIBLIOGRAPHY OF METEOROLOGY, CLIMATOLOGY, AND PHYSICAL/CHEMICAL OCEANOGRAPHY. VOLUME I INDEXES.
American Meteorological Society Washington D C
For primary bibliographic entry see Field 4B.
AD-713 493 MF$0.65

INVENTORY OF ARCHIVED DATA.
Catalog series.
National Oceanographic Data Center Washington D C

1969, 188P Rept no. NODC-Pub-C-3-Rev
Supersedes report dated 1966, AD-662 847.
Availability: Paper copy available from Naval Oceanographic Office, Washington, D. C. 20390. Price: $3.00.

Descriptors: (*Bathythermograph data, Maps), Pacific Ocean, Indian Ocean, Arctic Ocean, Antarctic regions, Atlantic Ocean, Marine meteorology.

The revision of the Inventory of Archived Data is designed to supply the oceanographic community with up-to-date information concerning the availability of different types of processed data for various geographic areas: The information is divided as follows: North Atlantic; South Atlantic; North Pacific; South Pacific; Indian Ocean; Arctic; and Antarctic. Within each division, station data charts precede BT charts. (Author)
AD-713 591 MF$0.65

MOORING SUMMARY 1969,
Woods Hole Oceanographic Institution Mass
For primary bibliographic entry see Field 13J.
AD-713 598 HC$3.00 MF$0.65

MAGNETIC AND GRAVITY PROFILES ACROSS THE ALPHA CORDILLERA AND THEIR RELATION TO ARCTIC SEA-FLOOR SPREADING,
Wisconsin Univ Madison
P. R. Vogt, and N. A. Ostenso. 17 Apr 70, 13p
Contracts Nonr-1202 (29), Nonr-1202 (16)
Prepared in cooperation with Global Ocean Floor Analysis and Research Center, Chesapeake Beach, Md. Revision of report dated 13 Dec 67.
Availability: Pub. in Jnl. of Geophysical Research, v75 n26 p4925-4937 10 Sep 70.

Descriptors: (*Ocean bottom topography, Arctic Ocean), (*Magnetic anomaly detection, Arctic Ocean), Gravity, Sedimentation, Thickness, Geologic age determination, Correlation techniques, Bathythermograph data, Echo ranging, Refraction, Ice islands.
Identifiers: Alpha Cordillera, Ocean ridges, Ocean bottom spreading, Arlis 2 ice island, Fletcher's ice island.

Magnetic profiles over the Alpha cordillera have anomalies of wavelength 5 to 30 km and amplitudes frequently exceeding 1000 gammas. Further, the profiles show a reasonable degree of mutual correlation and biaxial symmetry over the ridge crest. Finally, the profiles appear to correlate with those from the flanks of other well-documented ridges in the Greenland and Norwegian seas and can be matched with a sea-floor spreading model over the paleomagnetic time span of 40 to 60 m.y.b.p. From this evidence, as well as from newly presented gravity data and analysis of existing additional geophysical and geological information, it is concluded that the cordillera may have been a dormant mid-ocean ridge active at least between 40 and 60 m.y.b.p. If this hypothesis is correct, the spreading rate from the ridge axis was 1 cm/yr and ended abruptly 40 m.y. ago. (Author)
AD-713 686

MULTIPLE REFLECTIONS IN A WATER LAYER AND THEIR EFFECT ON THE RELIABILITY OF DATA INTERPRETATION IN SEISMIC MARINE SURVEYING,
Michigan Univ Ann Arbor Inst of Science and Technology
L. I. Kogan. 1970, 29p Rept no. VESIAC-13324
Contract SD-78
Trans. of unidentified Russian language article.

Descriptors: (*Marine geology, Ocean bottom topography), (*Echo ranging, Reflection), Hydrographic surveying, Underwater sound, TNT, Seismometers, Piezoelectric gages, Deposits, Baltic Sea, Arctic Ocean, Black Sea, Kara Sea, USSR.
Identifiers: Translations, Barents Sea, Caspian Sea.

Marine seismic investigations by the reflection method have been widely used in the USSR and abroad in recent years. The entry of marine seismic surveying into deep-sea water areas permitted conducting regional investigations of regions covered by a thick layer of water. A real possibility has appeared of solving complex geological problems under the conditions of the deep marine basins. Regional seismic investigations began to be conducted regularly in the USSR in 1956 and are being conducted at the present time in the Barents, Baltic Azov, Black, Caspian and Kara (in the Gulf of Ob and Yenisei Bay) Seas. (Author)
AD-713 721 HC$3.00 MF$0.65

DIFFUSION OF THE CORE OF MEDITERRANEAN WATER ABOVE THE MID-ATLANTIC RIDGE CREST.
Woods Hole Oceanographic Institution Mass
For primary bibliographic entry see Field 8C.
AD-713 836

ANALYSIS OF SEA WATER BY DIFFERENCE CHROMATOGRAPHY.
Summary progress rept. 1969-70,
Woods Hole Oceanographic Institution, Mass.
Paul C. Mangelsdorf, Jr., and T. Roger S. Wilson. 1970, 21p
Contract AT (30-1)-3838

Descriptors: (*Sea water, *Chromatographic analysis), (*Sediment transport, *Oceanographic data), Ion exchanging.

For abstract, see NSA 24 20.
NYO-3838-5 HC$3.00 MF$0.65

A STUDY OF INTERNAL WAVES IN THE STRAIT OF GIBRALTAR DURING OCTOBER - NOVEMBER 1967.
Saclant ASW Research Center, La Spezia (Italy).
For primary bibliographic entry see Field 8C.
For abstract, see STAR 08 21.
N70-38607 HC$3.00 MF$0.65

ACOUSTIC AND OTHER PHYSICAL PROPERTIES OF DEEP SEA SEDIMENTS IN THE TYRRHENIAN ABYSSAL PLAIN.
Saclant ASW Research Center, La Spezia (Italy).
P. Blavier, C. Gehin, A. Kermabon, and B. Tonarelli. 30 Apr 68, 57p SACLANTCEN-TR-113

Descriptors: *Core sampling, *Mediterranean sea, *Sediments, Acoustic velocity, Electrical resistivity, Moisture content, Ocean bottom, Porosity, Sonar, Stratification, Void ratio.

For abstract, see STAR 08 21.
N70-38670 HC$3.00 MF$0.65

DEVELOPMENT OF SIMPLE EQUATIONS FOR ACCURATE AND MORE REALISTIC CALCULATION OF THE SPEED OF SOUND IN SEA WATER.
Saclant ASW Research Center, La Spezia (Italy).
C. C. Leroy. 15 Nov 68, 49p SACLANTCEN-TR-128

Descriptors: *Acoustic velocity, *Sea water, *Underwater acoustics, Depth, Formulas (mathematics), Latitude, Salinity, Water temperature.

For abstract, see STAR 08 21.
N70-38735 HC$3.00 MF$0.65

THE RELATIONSHIP OF POROSITY WITH DENSITY, ELECTRICAL RESISTIVITY, AND SOUND VELOCITY OF SOME UNCONSOLIDATED DEEP-SEA SEDIMENTS TAKEN FROM THE TYRRHENIAN SEA.
Saclant ASW Research Center, La Spezia (Italy).
P. Blavier, C. Gehin, and A. Kermabon. 30 Apr 68, 33p SACLANTCEN-TR-114

Descriptors: *Density (mass/volume), *Electrical resistivity, *Ocean bottom, *Porosity, *Sediments, Acoustic velocity, Core sampling, Curve fitting, Mediterranean sea.

For abstract, see STAR 08 21.
N70-38808 HC$3.00 MF$0.65

A DEEP-SEA ELECTRICAL RESISTIVITY PROBE.
Saclant ASW Research Center, La Spezia (Italy).
P. Blavier, C. Gehin, and A. Kermabon. 30 Apr 68, 27p SACLANTCEN-TR-115

Descriptors: *Electric equipment, *Electrical resistivity, *Measuring instruments, *Ocean bottom, *Sediments, Core sampling, Density measurement, Depth measurement, Electrical measurement, Mediterranean sea, Penetration, Porosity.

For abstract, see STAR 08 21.
N70-38874 HC$3.00 MF$0.65

MODIFICATIONS TO THE SALLANTCEN SPHINCTER CORER.
Saclant ASW Research Center, La Spezia (Italy).
P. Blavier, C. Gehin, and B. Matteucci. 15 Mar 69, 14p SACLANTCEN-TR-112-SUPPL

Descriptors: *Core sampling, *Ocean bottom, *Pistons, *Positioning devices (machinery), Ring structures, Wave fronts.

For abstract, see STAR 08 21.
N70-38919 HC$3.00 MF$0.65

A RECOILESS PISTON FOR THE SACLANTCEN SPHINCTER CORER.
Saclant ASW Research Center, La Spezia (Italy).
U. Cortis, and A. Kermabon. 15 May 68, 27p SACLANTCEN-TR-112

Descriptors: *Core sampling, *Ocean bottom, *Pistons, *Positioning devices (machinery), *Ring structures, Recoilings, Wave fronts.

For abstract, see STAR 08 21.
N70-38920 HC$3.00 MF$0.65

A SIMPLE AND ACCURATE FORMULA FOR THE CALCULATION OF THE VELOCITY OF SOUND IN SEA WATER.
Saclant ASW Research Center, La Spezia (Italy).
C. C. Leroy. 1 Apr 68, 35p SACLANTCEN-TR-111

Descriptors: *Acoustic velocity, *Formulas (mathematics), *Sea water, *Underwater acoustics, Depth, Latitude, Oceans, Salinity, Water temperature.

For abstract, see STAR 08 21.
N70-38930 HC$3.00 MF$0.65

COLUMBIA RIVER EFFECTS IN THE NORTHEAST PACIFIC.
Washington Univ., Seattle. Dept. of Oceanography.
For primary bibliographic entry see Field 8H.
For abstract, see NSA 24 20.
RLO-1725-180 HC$3.00 MF$0.65

8K. Seismology

BATHYMETRY PROGRAM KURILE ISLANDS EXPERIMENT.
Texas Instruments Inc Dallas Science Services Div
For primary bibliographic entry see Field 8J.
AD-713 126 HC$3.00 MF$0.65

STATIC DETERMINATION OF THE EQUATION-OF-STATE OF CEDAR CITY TONALITE.
Battelle Memorial Inst Columbus Ohio Columbus Labs
For primary bibliographic entry see Field 8G.
AD-713 175 HC$3.00 MF$0.65

THE TRAVEL TIMES OF S AND SKS,
Texas Univ Dallas
A. L. Hales, and J. L. Roberts. 7 Aug 69, 30p
AFCRL-70-0448
Contract F19628-67-0419, Grant NsG-269-62
Contribution no. 113 of the Geosciences Div.
Availability: Pub. in Bulletin of the Seismological Society of America, v60 n2 p461-489 Apr 70.

Descriptors: (*Seismic waves, Velocity), Earthquakes, Structural geology, Anomalies, Seismological stations, Seismometers, Diffraction, Measurement.
Identifiers: Long range seismometers.

Observations are reported of the travel times of S and SKS for arc distances of 30 to 126 degrees. It was found that for S the new times do not differ significantly from the Jeffreys-Bullen tables up to 80 degrees and are up to 4 seconds later between 80 and 100 degrees. The apparent velocity found for the diffracted S phase was 1/8.941 degrees per second agreeing well with that reported by Cleary. The S station anomalies found in this study were about four times those for P in agreement with the earlier analysis of Doyle and Hales. As was the case for P the travel times for S can be fitted to within experimental error by a quadratic in delta. However, in this case, the values of dT/d delta found from the raw data suggest that there is a discontinuity in dT/d delta at about 42 degrees.
AD-713 303

FAR FIELD CHARACTERISTICS OF GROUND SHOCK INDUCED BY EXPLOSIONS,
Army Engineer Waterways Experiment Station Vicksburg Miss
For primary bibliographic entry see Field 18C.
AD-713 521 HC$3.00 MF$0.65

DENVER EARTHQUAKES,
Edgewood Arsenal Md
Louis E. Garono. 1970, 14p

Descriptors: (*Earthquakes, Colorado), (*Wastes (Industrial), Disposal), Liquids, Safety, Dams, Underground structures, Pressure, Rock (Geology), Stresses, Correlation techniques, Chemicals.
Identifiers: Denver (Colorado), Chemical waste disposal.

The paper reviews the question of whether liquid waste disposal by the Rocky Mountain Arsenal caused microearthquakes in the area.
AD-713 526 HC$3.00 MF$0.65

ANALYSIS OF BODY - WAVE SPECTRA FOR EARTHQUAKE ENERGY DETERMINATION,
Saint Louis Univ Mo School of Engineering and Earth Science
Umesh Chandra. Jul 70, 30p Rept no. Scientific-12
AFCRL-70-0401
Contract AF 19 (628)-5100
Availability: Pub. in Bulletin of the Seismological Society of America, v60 n2 p539-563 Apr 70.

Descriptors: (*Earthquakes, Energy), Power spectra, Seismic waves, High frequency, Low frequency, Tables.
Identifiers: Earth mantle.

The study examines the body wave spectra of earthquake signals for the estimation of energy in the seismic waves by taking into account the radiation pattern of the source, the effect of geometrical spreading and absorption in the earth's mantle, the effect of crustal structure under the receiver and the response of the recording instruments. The focal mechanism solutions of one intermediate and four deep focus earthquakes analyzed in this study have been determined using the P wave first motion directions and the S wave polarization angles. All the mechanism solutions are well determined and conform to a double couple source model. In all 155 P wave time signals and 224 S wave time signals have been analyzed. The basic equations for estimating the energy in body waves from the spectra equalized to the source are discussed. The main uncertainties in the energy estimates are most likely due to the inadequate knowledge of the effect of absorption, which is quite sigificant at the high frequencies. Most of the low frequency energy is carried by the S waves. (Author)
AD-713 650

A METHOD OF SOLUTION OF THE INVERSE PROBLEM OF SEISMIC SURVEYING IN THE CASE OF A TILTED LAYERED MEDIUM,
Michigan Univ Ann Arbor Inst of Science and Technology
For primary bibliographic entry see Field 8G.
AD-713 723 HC$3.00 MF$0.65

SEISMIC ACTIVITY IN SEPTEMBER 1969 NEAR THE RULISON NUCLEAR TEST SITE,
Coast and Geodetic Survey, Rockville, Md.
For primary bibliographic entry see Field 18C.
For abstract, see NSA 24 20.
CGS-746-5 HC$3.00 MF$0.65

EARTHQUAKES AND NUCLEAR POWER PLANT DESIGN,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 18E.
For abstract, see NSA 24 20.
ORNL-NSIC-28 HC$3.00 MF$0.65

USE OF OPTICAL TRANSFORMS FOR ANALYSIS OF ACOUSTIC AND SEISMIC DATA,
Sandia Labs., Albuquerque, N. Mex.
R. G. Scharrer. Apr 70, 20p

Descriptors: (*Acoustic signals, Spectral energy distribution), (*Seismic waves, Spectral energy distribution), Time series analysis, Fourier transformation, Data processing, Microphotographs.

For abstract, see NSA 24 20.
SC-DR-70-206 HC$3.00 MF$0.65

OPTIMUM EQUIPMENT OF SEISMIC STATIONS WITH INSTRUMENTS FOR RECORDING STRONG EARTHQUAKES (Ob Optimalnom Oborudovanii Seismicheskikh Stantsii Priborami dlya Zapisi Silnykh Zemletryasenii),
National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.
Z. I. Aranovich, and N. V. Shebalin. 1970, 25p
SFCSI-Comm (TT-70-50121)
Trans. of mono. Apparatura i Metodika Seismometricheskikh Nablyudenii (Seismografy, Ostsillografy, Analizatory), Moscow, 1967 p115-125.

Descriptors: (*Earthquakes, *Recording instruments), (*Seismological stations, USSR), Seismometers, Epicenter, Magnitude, Dams, Reliability, Translations.

Considering the characteristics of instruments currently in production and the location of seismic stations in relation to seismically active regions, five optimum sets of instruments were recommended; they ensure satisfactory registration of all strong shocks, and a long-term plan was worked out for equipping Soviet seismic stations with these data. Initial data and criteria for selecting instruments are given. (Author)
TT-70-50121 HC$3.00 MF$0.65

8L. Snow, Ice, and Permafrost

FROST INVESTIGATION 1944-1945. REPORTS ON SIOUX FALLS AIRFIELD, SIOUX FALLS, SOUTH DAKOTA, FAIRMONT AIRFIELD, FAIRMONT, NEBRASKA, GREAT BEND AIRFIELD, GREAT BEND, KANSAS, GARDEN CITY AIRFIELD, GARDEN CITY, KANSAS, AND PRATT AIRFIELD, PRATT, KANSAS.
Arctic Construction and Frost Effects Lab Boston Mass
For primary bibliographic entry see Field 1E.
AD-713 280 HC$3.00 MF$0.65

OASES IN ANTARCTICA.
Israel Program for Scientific Translations, Ltd., Jerusalem.
For primary bibliographic entry see Field 4B.
For abstract, see STAR 08 21.
N70-38624 HC$3.00 MF$0.65

8M. Soil Mechanics

STATIC DETERMINATION OF THE EQUATION-OF-STATE OF CEDAR CITY TONALITE.
Battelle Memorial Inst Columbus Ohio Columbus Labs
For primary bibliographic entry see Field 8G.
AD-713 175 HC$3.00 MF$0.65

FROST INVESTIGATION 1944-1945. REPORTS ON SIOUX FALLS AIRFIELD, SIOUX FALLS, SOUTH DAKOTA, FAIRMONT AIRFIELD, FAIRMONT, NEBRASKA, GREAT BEND AIRFIELD, GREAT BEND, KANSAS, GARDEN CITY AIRFIELD, GARDEN CITY, KANSAS, AND PRATT AIRFIELD, PRATT, KANSAS.
Arctic Construction and Frost Effects Lab Boston Mass
For primary bibliographic entry see Field 1E.
AD-713 280 HC$3.00 MF$0.65

EROSION CONTROL ON AIR FORCE BASES.
Technical note,
Water Resources Engineers Inc Walnut Creek Calif
DeLynn R. Hay, D. F. Kibler, and C. E. Busby.
Aug 70, 25p WLC-TN-70-018
Contract F29601-69-C-0039
Presented at the Annual Meeting of the American Society of Agronomy, Div. A-2, Tucson, Ariz., 24-28 Aug 70.

Descriptors: (*Erosion, Control), (*Soils, Erosion), (*Construction, Military facilities), State-of-the-art reviews, Control, Rainfall, Drainage, Intensity, Exposure, Terrain, Wind, Water, Particles, Air Force Operations.
Identifiers: *Erosion control.

A state-of-the-art review of the soil erosion field as it relates to the erosion control needs of the US Air Force was conducted. The review will serve as a guide for preparation of a Base Civil Engineer erosion control handbook. Typical military construction activities which have exposed large areas of unprotected soil and subsequently have led to

serious erosion problems are presented. Factors involved in the wind and erosion processes are discussed and soil-loss equations and soil erodibility indices are reviewed. The erodibility K-factor in the ARS soil-loss equation is evaluated for land management planning techniques. Guidelines for effective erosion control practices to protect exposed land surfaces against soil particle detachment and transport by either water or wind are presented. Further efforts to establish a more reliable erodibility index which can be used to define areas of highly erodible soils, especially for subsurface soils that are exposed during construction are indicated. (Author)
AD-713 644 HC$3.00 MF$0.65

WALKER BRANCH WATERSHED PROJECT: CHEMICAL, PHYSICAL AND MORPHOLOGICAL PROPERTIES OF THE SOILS OF WALKER BRANCH WATERSHED,
Oak Ridge National Lab., Tenn.
L. N. Peters, D. F. Grigal, J. W. Curlin, and W. J. Selvidge. Aug 70, 96p
Contract W-7405-eng-26

Descriptors: (*Soil surveys, Tennessee), Soil chemistry, Tennessee, Bulk density, Moisture content, Cation exchanging, Watersheds.
Identifiers: Walker Branch Watershed.

For abstract, see NSA 24 20.
ORNL-TM-2968 HC$3.00 MF$0.65

THE INFLUENCE OF PHYSICAL-MECHANICAL PROPERTIES OF SOIL ON THE WEAR OF CULTIVATOR POINTS,
National Tillage Machinery Lab., Auburn, Ala.
For primary bibliographic entry see Field 2C.
PB-194 840T HC$3.00 MF$0.65

RELATIONSHIP OF MECHANICAL CHARACTERISTICS OF SOIL TO ITS HARDNESS AND SPEED OF DEFORMATION WITH A ROLLING WHEEL,
National Tillage Machinery Lab., Auburn, Ala.
D. I. Zolotarevskaya. 8 May 70, 7p
Trans. of Moskovskaya Selskokhozyaistvennaya Akademiya. Doklady (USSR) n131 p381-386 1967, by William R. Gill.

Descriptors: (*Agricultural machinery, *Vehicle wheels), (*Cohesive soils, Deformation), Hardness, Soil mechanics, Viscoelesticity, Trafficability, Translations, USSR.
Identifiers: Soil machine relations.

The deformation of cohesive soil was determined to determine its mechanical characteristics in relation to the physical properties and deformation by rolling wheels. An equation was suggested to approximately describe the vehavior of visco-elastic properties. Bulk density, depth of deformable soil layer, load on the wheel and angular velocity of the wheel were varied. A linear relation was found between a visco-elastic parameter of the soil and the mechanical properties. (NTML abstract)
PB-194 842T HC$3.00 MF$0.65

X-RAY METHOD OF EVALUATING MIXING OF SOIL LAYERS,
National Tillage Machinery Lab., Auburn, Ala.
O. V. Vernyaev, N. A. Sokol, and A. G. Karapetvan. 7 May 70, 7p
Trans. of Traktory i Selkhozmashiny (USSR) n7 p23-25 1969, by William R. Gill.

Descriptors: (*Soils, Mixing), (*Radiography, Soils), Cultivation, Wind (Meteorology), Erosion, Dust, Translations, USSR.

Studies showed that with the help of the developed X-ray method according to the darkness of the X-ray film it is possible to determine the composition of dust and clod fractions of soil. The method permitted establishing that the working tools vibrated in the horizontal plane during surface tillage of soil can prepare a wind stable upper layer with a system with forward speed of 8-12 km/hr, vibrational frequency 388-466 vibrations per minute, aptitude plus or minus 19 degrees and lift angle of tool 15-22 degrees. (Author)
PB-194 843T HC$3.00 MF$0.65

THE NECESSITY OF A SYSTEMATIC STUDY OF THE TECHNOLOGICAL PROPERTIES OF SOIL,
National Tillage Machinery Lab., Auburn, Ala.
G. N. Sineokov. 7 May 70, 6p
Trans. of Traktory i Selkhozmashiny (USSR) n12 p20-21 1969, by William R. Gill.

Descriptors: (*Soil properties, Classifications), (*Agricultural machinery, Performance), Friction, Cultivation, Construction, Soil classification, Design, Translations, USSR.

Complex studies of the physico-mechanical properties of soil (abrasiveness, coefficients of friction, specific resistance to plowing, stoniness) are necessary to provide information for the correct construction, design and rational use of agricultural machinery. A suggestion is made that the V. V. Dokuchaev Soil Institute organize the study of these properties in the various republics of the USSR for the purpose of making better land evaluations. (NTML abstract)
PB-194 849T HC$3.00 MF$0.65

TIME - DEPENDENT DEFORMATION CHARACTERISTICS OF COMPACTED COHESIVE SOILS.
Progress rept.,
Purdue Univ., Lafayette, Ind. Joint Highway Research Project.
S. V. Ramaswamy, and W. H. Perloff. May 70, 76p
JHRP-13-May-70
Prepared in cooperation with Bureau of Public Roads, Washington, D.C.

Descriptors: (*Cohesive soils, Deformation), (*Roads, *Embankments), Mathematical models, Creep properties, Stresses, Pressure, Failure, Pore pressure, Moisture, Soil mechanics, Loads (Forces), Viscoelasticity.

The objectives of the overall project are to develop a model for predicting long-term deformation of compacted clay embankments and to demonstrate that the model is a valid predictor under field conditions. The present work concerns the time-dependent mechanical behavior of compacted cohesive soils. Two commercially prepared soils, 'Edgar Plastic Kaolin' and 'Grundite' were tested. (BPR abstract)
PB-194 897 HC$3.00 MF$0.65

EVALUATION AND PREDICTION OF THE TENSILE PROPERTIES OF LIME-TREATED MATERIALS.
Texas Univ., Austin. Center for Highway Research.
For primary bibliographic entry see Field 13B.
PB-194 899 HC$3.00 MF$0.65

PREDICTION OF MOISTURE MOVEMENT IN EXPANSIVE CLAYS.
Texas Univ., Austin. Center for Highway Research.
For primary bibliographic entry see Field 8H.
PB-194 910 HC$3.00 MF$0.65

THE QUESTION OF USING A CLASSIFICATION OF SOILS BASED ON THEIR DIFFICULTY OF WORKING,
National Tillage Machinery Lab., Auburn, Ala.
A. N. Zelenin, N. N. Zhiveinov, and G. A. Avigdor. 6 May 70, 11p
Trans. of Stroitelnye i Dorozhnye Mashiny (USSR) v15 n1 p15-19 1970, by William R. Gill.

Descriptors: (*Soil properties, Classification), (*Cultivation, Soils), Cutting, Frozen soils, Measuring instruments, Rheological properties, Earth handling equipment, Soil classification, Deformation, Cohesive soils, Translations, USSR.
Identifiers: Penetrometers, Soil strength.

The classification of the resistance to cutting of frozen and unfrozen soils corresponds to the physical nature of the process of cutting and is suitably accurate, since it is determined by a large numerical range of C values. It allows quickly determining the place of the soil on the outside scale with the help of a dynamic penetrometer and gives the possibility of more accurately establishing the limit of use of designed machines and also determing the norm of output for earthmoving machines in actual working conditions. All this allows more correctly evaluating the effectiveness of earth working machines in relation to complex physico-mechanical properties of worked ground. (Author)
PB-194 990T HC$3.00 MF$0.65

DETERMINATION OF THE SPECIFIC RESISTANCE OF SOIL BY VALUES OF HARDNESS,
National Tillage Machinery Lab., Auburn, Ala.
A. A. Kuznetsov. 2 Jun 70, 7p
Trans. of Traktory i Selkhozmashiny (USSR) v32 n2 p27-29 1962, by William R. Gill.

Descriptors: (*Soils, Hardness), Measuring instruments, Plows, Cultivation, Deformation, Efficiency, Applications of mathematics, Translations, USSR.
Identifiers: Soil strength, Tillage.

The hardness of soil as determined by a vane shear is correlated with the specific resistance of soil as measured using a plow. Lambda is the ratio of the specific resistance of a plow to the hardness as measured by a soil meauring device. 1/lambda increases with increases in depth of operation in most soils and the relation may be used to set a norm for the expenditure of fuel for plowing. (Author)
PB-194 991T HC$3.00 MF$0.65

STUDY OF THE ROLLING RESISTANCE OF LOW PRESSURE TIRES ON SOIL,
National Tillage Machinery Lab., Auburn, Ala.
For primary bibliographic entry see Field 2C.
PB-194 995T HC$3.00 MF$0.65

NUCLEAR MEASUREMENT OF SOIL PROPERTIES.
Final rept.
Virginia Highway Research Council, Charlottesville.
M. C. Anday, and C. S. Hughes. Jun 70, 16p

Descriptors: (*Soil water, Measurement), (*Radiation measuring instruments, Performance), Standards, Iron inorganic compounds, Porosity, Sampling, Atterberg limits, Chemical analysis, Statistical data, Roads, Virginia.

The study was concerned with the development of improved moisture calibration methods for use with nuclear moisture gages. The objectives of the study were to: (a) determine the shape of the calibration curves for different soils (b) determine accuracy of a single calibration curve and (c) develop primary or secondary moisture standards. Ten soils were studies. The following conclusions were reached: (1) The single calibration curve seems to be a linear response between count ratio and moisture content; (2) the variation for a single calibration curve was found to be 3pcf; (3) the variability does not seem to be a direct function of some of the chemical components studies; (4) there is an indication that the data can be separated into two groups and that two calibration curves will improve the accuracy of nuclear moisture tests. A significant correlation was found between some physical properties and distribution

of the data. Work on objective c, development of primary or secondary mossture standards, was deferred pending further investigation into the causes of the variability. (BPR abstract).
PB-195 182 HC$3.00 MF$0.65

FOUNDATION INSTRUMENTATION AT PLEASANT VALLEY PUMPING PLANT,
Bureau of Reclamation, Denver, Colo. Office of Chief Engineer.
For primary bibliographic entry see Field 13M.
PB-195 272 HC$3.00 MF$0.65

STATIC DETERMINATION OF THE DEFORMATIONAL PROPERTIES OF SOLID MATERIALS WITH PRESSURE,
California Univ., Livermore. Lawrence Radiation Lab.
For primary bibliographic entry see Field 14B.
For abstract, see NSA 24 20.
UCRL-50852 HC$3.00 MF$0.65

8N. Terrestrial Magnetism

AURORAL OVAL PLOTTER AND NOMOGRAPH FOR DETERMINING CORRECTED GEOMAGNETIC LOCAL TIME, LATITUDE, AND LONGITUDE FOR HIGH LATITUDES IN THE NORTHERN HEMISPHERE.
Air Force Cambridge Research Labs L G Hanscom Field Mass
For primary bibliographic entry see Field 4A.
AD-713 170 HC$3.00 MF$0.65

THE HIGH-LATITUDE F-REGION IRREGULARITY STRUCTURE DURING THE OCTOBER 30-NOVEMBER 4, 1968, MAGNETIC STORM.
Air Force Cambridge Research Labs L G Hanscom Field Mass
For primary bibliographic entry see Field 4A.
AD-713 363

9. ELECTRONICS AND ELECTRICAL ENGINEERING

9A. Components

COMPUTER PROGRAMS FOR RADIATION AND SCATTERING BY ARBITRARY CONFIGURATIONS OF BENT WIRES,
Syracuse Univ N Y Dept of Electrical Engineering
For primary bibliographic entry see Field 20N.
AD-713 156 HC$3.00 MF$0.65

MAGNETOSTRICTIVE GENERATION OF SURFACE ELASTIC WAVES,
California Univ Berkeley Dept of Electrical Engineering
For primary bibliographic entry see Field 20A.
AD-713 245

MICROWAVE ACOUSTIC RESONANCES IN THIN PIEZOELECTRIC DISKS,
Air Force Cambridge Research Labs L G Hanscom Field Mass
For primary bibliographic entry see Field 20A.
AD-713 325

ELECTROMAGNETIC WAVE-CHARGE INTERACTION IN CROSSED FIELDS.
Final rept. 15 May 67-15 Jun 70,
California Univ Berkeley Electronics Research Lab
K. A. Fox, M. A. Meyer, S. Swierkowski, C. W. Turner, and T. Van Duzer. Sep 70, 90p* Rept no. ERL-70-4 ECOM-0227-F
Contract DAAB07-67-C-0227

Descriptors: (*Crossed field devices, *Microwave amplifiers), (*Semiconductor devices, Ultrasonic radiation), Electromagnetic waves, Electron guns, Space charges, Semiconductors, Cryogenics, Indium antimonides, Piezoelectric crystals, Carriers (Semiconductors).
Identifiers: Surface waves, Magnetoresistivity, Piezoelectric semiconductors, Semiconductor plasmas, Helicons.

The purpose of the work on this contract is to investigate the interaction of electromagnetic waves and charge carriers in vacuum and solids. A crossed-field microwave vacuum-tube amplifier has been designed for low-noise operation. The paraxial crossed-field gun design method has been extended to use on magnetically shielded guns. A study of optically stimulated emission from a cathode of suitable form for a crossed-field tube has been conducted. An experimental and theoretical study of electromagnetic and space-charge waves in semiconductors has been performed. A study has been made of the propagation and amplification of bulk acoustic waves in crossed electric and magnetic fields. A study of surface-wave amplification on InSb in crossed electric and magnetic fields has been made. (Author)
AD-713 399 HC$3.00 MF$0.65

SEMI-CONDUCTOR INTEGRATED CIRCUIT COMPONENT MODELS.
Technical rept.,
Cullen Coll of Engineering Houston Tex
Don L. Cannon. Jul 70, 39p Rept no. THEMIS-RE-2-70
Contract N00014-68-A-0151
Report on Information Processing Systems.

Descriptors: (*Integrated circuits, Semiconductor devices), (*Semiconductor devices, Mathematical models), Model tests, Resistors, Capacitors, Diodes (Semiconductor), Transistors, Theses.
Identifiers: Computer aided design, Themis project, Metal oxide semiconductors, Equivalent circuits.

The report attempts to summarize the presently available models for feasibly describing the active and passive components in an integrated structure. Emphasis is on a presentation of the basic approach of the model with references given for the detailed derivation and characterization of the model. (Author)
AD-713 475 HC$3.00 MF$0.65

DIELECTRIC FIELD COMPUTATIONS IN SEMICONDUCTOR OXIDE INTEGRATED CIRCUITS.
Cullen Coll of Engineering Houston Tex
For primary bibliographic entry see Field 9E.
AD-713 476 HC$3.00 MF$0.65

DEVELOPMENT OF AN IMPROVED SOLID ELECTROLYTIC CAPACITOR.
Final engineering rept. 25 Apr 60-25 Jun 61,
Philco Corp Blue Bell Pa
Basil J. Nicholson. 25 Aug 61, 55p Rept no. 9007-F
Contract NObsr-72770

Descriptors: (*Electrolytic capacitors, Design), (*Silicon carbides, Electrolytic capacitors), Dielectrics, Silicon dioxide, Manganese compounds, Dioxides, Foams, Electrolytes, Leakage (Electrical).

A study was made of foamed silicon carbide with a view to utilizing this material as the basis of a solid electrolytic capacitor. The capacitor dielectric consists of a surface film of silica produced by thermal oxidation at 1200C. The foam is electrically conducting and provides contact to one side of the dielectric; a manganese dioxide counter-electrode or a conducting electrolyte can make contact to the opposite face of the dielectric. An anodic forming step is necessary after oxidation in order to obtain low leakage currents at operating voltages. The effect of various oxidation parameters (time, temperature, pressure) upon electrical performance was assessed, and a number of electrolytes were examined in order to form the oxide. Anodic oxidation of single crystals of silicon carbide was also investigated. (Author)
AD-713 480 HC$3.00 MF$0.65

ANALYSIS AND APPLICATION OF GALLIUM ARSENIDE AVALANCHE TRANSIT TIME DEVICES,
Army Electronics Command Fort Monmouth N J Electronic Components Lab
Joseph J. Baranowski, and Vincent J. Higgins. 1970, 15p

Descriptors: (*Microwave oscillators, *Gallium arsenides), (*Diodes (Semiconductor), Design), Negative resistance circuits, Avalanche diodes, Radar equipment, Army equipment.
Identifiers: AN/PPS-5, Gunn diodes.

The theoretical analysis of gallium arsenide avalanche transit time devices has been presented. This analysis has established the criteria for optimum design of oscillators and amplifiers and has led to the application of these devices in Army communications and radar systems. (Author)
AD-713 509 HC$3.00 MF$0.65

ULTRA HIGH SPEED GERMANIUM MESA SWITCHING TRANSISTOR.
Final rept.,
Massachusetts Inst of Tech Lexington Lincoln Lab
Doyle S. Granberry, E. C. Wurst, and R. L. Petritz. 18 Oct 62, 28p ESD-TR-70-311
Contract AF 19 (604)-7400
Prepared in cooperation with Texas Instruments, Inc., Dallas. Semiconductor-Components Div.

Descriptors: (*Transistors, Germanium), Electronic switches, Design.
Identifiers: Mesa devices.

The purpose of the present work is to develop a saturated switching transistor suitable for switching rates as high as 125 Mc.
AD-713 607 HC$3.00 MF$0.65

ADMITTANCE BRIDGE DETERMINATION OF QUARTZ VIBRATOR PARAMETERS USING AUGMENTING IMMITTANCE ELEMENTS,
Army Electronics Command Fort Monmouth N J
Arthur Ballato, and George R. Oliva, Jr. 12 Dec 69, 8p
Availability: Pub. in IEEE Transactions on Instrumentation and Measurement, vIM19 n2 p128-135 May 70.

Descriptors: (*Quartz resonators, Test methods), Vibrators (Electrical), Admittance, Electric bridges, Analysis.

Bridge methods are the most accurate means of determining the parameters of quartz vibrators, particularly in the VHF region and above. Present and future crystal requirement specifications point to the increasing use of such methods to obtain the accuracy necessary for both filter and oscillator applications. A practical difficulty that arises is that the ranges of any given bridge are not compatible with every immittance characteristic encountered with the various crystal types in use, particularly if measurements are to be made over substantially different portions of the region of resonance. One means of obviating this difficulty is to augment the crystal with another impedance element in series or parallel so that the behavior of the combination is accommodated within the bridge ranges. A capacitance in parallel with the crystal is suitable for reducing the variation in impedance bridges that consider the unknown as a series combination of resistance and reactance; a series element reduces the variation in admittance

bridges that represent the unknown as a conductance and susceptance in parallel. The purpose of this paper is to discuss the applicability and limitations of this latter procedure and to describe how the crystal parameters are extracted from measurements of this type. (Author)
AD-713 742

NUMERICAL SOLUTION OF WAVEGUIDE SCATTERING PROBLEMS BY FINITE-DIFFERENCE GREEN'S FUNCTIONS,
Massachusetts Inst of Tech Cambridge Research Lab of Electronics
For primary bibliographic entry see Field 20N.
AD-713 749

STUDIES TO DETERMINE THE RELIABILITY OF RELAYS BUREAU OF SHIPS SPECIFICATION SHIPS-R-405 DATED 1 MARCH 1951.
Final development rept. 1 Jun 51-31 Aug 52.
Oklahoma State Univ Stillwater
1 Mar 51, 211p
Contract NObrs-52423

Descriptors: (*Relays, Reliability (Electronics)), Standards, Design, Specifications.

Contents: Relay standards; Relay testing; Relay specifications; Relay design; Relay contacts; Directory of relay manufacturers; and Bibliography on relays.
AD-713 835 HC$3.00 MF$0.65

RESPONSE OF ROCK INCLUSIONS TO AIR BLAST.
Naval Civil Engineering Lab., Port Hueneme, Calif.
For primary bibliographic entry see Field 8G.
AD-872 810 HC$3.00 MF$0.65

EVALUATION TESTING OF THERMOFIT SOLDER SLEEVES.
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
9 Sep 69, 74p NASA-TM-X-53879, MSFC-IN-R-QUAL-67-10

Descriptors: *Performance tests, *Sleeves, *Soldered joints, *Wire, Alloys, Copper, Electric terminals, Reliability engineering, Soldering.

For abstract, see STAR 08 21.
N70-38170 HC$3.00 MF$0.65

INVESTIGATIONS INTO THE RADIATION DAMAGE OF SEMICONDUCTOR DEVICES AND THE RADIATION HARDENING OF PLANAR TRANSISTORS BY MEANS OF IR-RADIATION-ANNEALING CYCLES.
Untersuchungen Ueber Die Strahlenschaedigung Von Halbleiterbauelementen Sowie Ueber Die Verbesserung Der Strahlenresistenz Von Planartransistoren Durch Bestrahlungs-ausheil-zyklen
Siemens-schuckertwerke A. G., Erlangen (West Germany). Forschungslaboratorium.
H. Arndt, R. Baeuerlein, D. Uhl, and W. Urueger.
May 70, 184p BMBW-FB-W-70-26
Lang- in German, English Summary Spon- Sponsored By Bundesmin. Fuer Bildung Und Wiss.

Descriptors: *Field effect transistors, *Radiation effects, *Silicon transistors, *Tunnel diodes, Annealing, Electrical properties, Electron irradiation, Germanium diodes, Metal oxide semiconductors, Planar structures, Proton irradiation.

For abstract, see STAR 08 21.
N70-38486 HC$3.00 MF$0.65

ELECTRIC IMPEDANCE CALCULATION FOR MULTIPHASE RECTANGULAR CONDUCTOR SYSTEMS BY ANALOG METHOD.
Eidgenossische Technische Hochschule, Zurich (Switzerland).
For primary bibliographic entry see Field 20C.
For abstract, see STAR 08 21.
N70-38759 HC$3.00 MF$0.65

THERMAL BEHAVIOR IDENTIFICATION OF A POWER DIODE.
Identifikation des Thermischen Verhaltens Einer Hochleistungsdiode
Eidgenossische Technische Hochschule, Zurich (Switzerland).
W. Koechli. 1969, 127p DISS-4200
Lang- in German, English Summary

Descriptors: *Diodes, *Mathematical models, *Silicon, *Thermodynamic properties, Semiconductor devices, Thermal stability.

For abstract, see STAR 08 21.
N70-38761 HC$3.00 MF$0.65

METHODS OF MEASUREMENT FOR SEMICONDUCTOR MATERIALS, PROCESS CONTROL, AND DEVICES.
National Bureau of Standards, Washington, D.C.
For primary bibliographic entry see Field 20L.
PB-194 961 HC$0.65 MF$0.65

PRINCIPLES OF HIGH-VOLTAGE PULSE REFLECTION-TYPE ATTENUATORS,
California Univ., Berkeley. Lawrence Radiation Lab.
Robert J. Thomas. 11 May 66, 33p

Descriptors: (*Attenuators, Electromagnetic pulses), Reflection, Transmission lines.

For abstract, see NSA 24 20.
UCRL-14722 HC$3.00 MF$0.65

MEASURED TIME AND FREQUENCY RESPONSE OF A MINIATURE SUPERCONDUCTING COAXIAL LINE,
California Univ., Livermore. Lawrence Radiation Lab.
For primary bibliographic entry see Field 20C.
For abstract, see NSA 24 20.
UCRL-72574 HC$3.00 MF$0.65

9B. Computers

STRUCTURAL INFLUENCE COEFFICIENTS FOR A REDUNDANT SYSTEM INCLUDING BEAM-COLUMN EFFECTS: ANALYTICAL DEVELOPMENT AND COMPUTATIONAL PROCEDURE.
Aerospace Corp., El Segundo, Calif. Lab. Operations.
For primary bibliographic entry see Field 20K.
AD-472 604 HC$3.00 MF$0.65

A BASIC LIST-ORIENTED INFORMATION STRUCTURES SYSTEM (BLISS).
Master's thesis,
Naval Postgraduate School Monterey Calif
Charles Scott Thorell, and William Otto Poteat, Jr.
Jun 70, 177p

Descriptors: (*Programming languages, Design), Computer programs, Syntax, Algorithms, Computers, Time sharing, Theses.
Identifiers: BLISS computer code, *List processing languages, On line computers.

The design and implementation of the Basic List-Oriented Information Structures System is described. Manipulation of list structures in an efficient and cogent manner is the system function. The language, which is patterned after Bell Telephone Laboratories' L6, is generated from a precedence grammar for rapid syntax analysis. A compiler produces code for a pseudo-machine that is designed to effectively carry out list-oriented functions. Dynamic storage allocation and structure definition are significant execution-time features. The implementation, written in PL/I, is for operation under the CP/CMS time-sharing system on the IBM 360/67. (Author)
AD-713 079 HC$3.00 MF$0.65

THE APPLICATION OF COMPUTER GRAPHICS TO MULTIHARMONIC ANALYSIS OF STRUCTURAL SHELLS.
Air Force Flight Dynamics Lab Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 20K.
AD-713 101 HC$3.00 MF$0.65

BOMS II, BUCKLING OF STIFFENED MULTILAYERED CIRCULAR CYLINDRICAL SHELLS WITH DIFFERENT ORTHOTROPIC MODULI IN TENSION AND COMPRESSION.
Aerospace Corp San Bernardino Calif San Bernardino Operations
For primary bibliographic entry see Field 20K.
AD-713 113 HC$3.00 MF$0.65

DEADLOCK-FREE SHARING OF RESOURCES IN ASYNCHRONOUS SYSTEMS.
Massachusetts Inst of Tech Cambridge Dept of Electrical Engineering
For primary bibliographic entry see Field 12B.
AD-713 139 HC$3.00 MF$0.65

FORMAT-FORTRAN MATRIX ABSTRACTION TECHNIQUE. VOLUME VI. SUPPLEMENT I. DESCRIPTION OF DIGITAL COMPUTER PROGRAM. PHASE I. EXTENDED.
Douglas Aircraft Co Long Beach Calif
For primary bibliographic entry see Field 20K.
AD-713 149 HC$3.00 MF$0.65

STUDY OF COMPUTER GRAPHICS AND SIGNAL CLASSIFICATION APPLICATIONS.
Final technical rept. 17 Mar 69-17 Apr 70,
General Electric Co Syracuse N Y Electronics Lab
A. Wayne Whitney, and William E. Blasdell. Sep 70, 169p* RADC-TR-70-148
Contract F30602-69-C-0227

Descriptors: (*Data processing systems, Graphics), (*Information theory, *Pattern recognition), Input-output devices, Fourier analysis, Statistical analysis, Decision theory, Vector spaces.
Identifiers: *Interactive computer graphics, *Computer graphics, Statistical decision theory.

The purpose of the study was to investigate and recommend techniques that use an interactive computer graphics system to design signal classification procedures for signal classification problems. Many of these signal classification problems have no solutions yet, and a model does not exist from which a theoretical solution can be derived. These signal classification problems are characterized by the fact that the classification information present in the signals must be extracted from a limited number of design signals and some limited knowldege concerning the environment from which the signals were obtained. Given very little a priori information concerning these signal classification problems, it is necessary to directly employ the inventive capability of the human pattern recognizer as well as any applicable mathematical or statistical techniques. In this report, various aspects of signal analysis and classification are investigated and techniques are recommended for use in a computer graphics facility to design signal classification systems. (Author)
AD-713 155 HC$3.00 MF$0.65

EDGE AND CURVE DETECTION FOR VISUAL SCENE ANALYSIS.
Maryland Univ College Park Computer Science Center
For primary bibliographic entry see Field 6P.
AD-713 159 HC$3.00 MF$0.65

MULTI-STACK-COUNTER LANGUAGES,
System Development Corp Santa Monica Calif
Ronald Book, and Seymour Ginsburg. 28 Aug 70, 37p Rept nos. TM-738/060/00, Scientific-7 AFCRL-70-0515
Contracts F19628-70-C-0023, F44620-70-C-0013
Sponsored in part by Grant NSF-GJ-454.

Descriptors: (*Programming languages, Computational linguistics), Design, Set theory, Mathematical models, Data storage systems, Real time, Theorems.
Identifiers: Stack counter acceptors, AFL (Abstract Family of Languages), Abstract family of languages.

A stack-counter acceptor is a stack acceptor in which the storage alphabet is just one letter. The present paper discusses multi-stack-counter acceptors operating in quasi-realtime, i.e., acceptors in which each storage tape is a stack counter and in which there are only a bounded number of consecutive E-moves. It is shown that the quasi-real-time k-stack-counter acceptor is equivalent to one operating in nondeterministic real-time. Lastly, it is shown that acceptance by final state of a k-stack-counter acceptor is equivalent to acceptance by empty tape and final state. (Author)
AD-713 160 HC$3.00 MF$0.65

SHAPE SYNTHESIS, I,
Maryland Univ College Park Computer Science Center
For primary bibliographic entry see Field 6D.
AD-713 163 HC$3.00 MF$0.65

PRACTICAL USE OF THE FAST FOURIER TRANSFORM (FFT) ALGORITHM IN TIME-SERIES ANALYSIS.
Texas Univ Austin Applied Research Lab
For primary bibliographic entry see Field 12A.
AD-713 166 HC$3.00 MF$0.65

A FORTRAN PROGRAM FOR WAVEGUIDE PROPAGATION WHICH ALLOWS FOR BOTH VERTICAL AND HORIZONTAL DIPOLE EXCITATION.
Naval Electronics Lab Center San Diego Calif
For primary bibliographic entry see Field 20N.
AD-713 168 HC$3.00 MF$0.65

A PROCEDURE FOR COMPUTING AND DISPLAYING TIME VARYING POWER SPECTRA ILLUSTRATED BY APPLICATION TO A GEOPHYSICAL PROCESS.
Johns Hopkins Univ Baltimore Md Chesapeake Bay Inst
For primary bibliographic entry see Field 8C.
AD-713 190 HC$3.00 MF$0.65

DEC PDP-7/IBM 1800 HIGH SPEED INTERFACE REFERENCE MANUAL.
Technical rept.,
Michigan Univ Ann Arbor
J. L. Foy, Jr., R. F. Brender, D. R. Frantz, and J. A. Miller. Aug 70, 139p Rept no. TR-31
Contract DA-49-083-OSA-3050, ARPA Order-716
Report on Proj. CONCOMP.

Descriptors: (*Digital computers, Interfaces), Data processing systems, Data transmission systems, Data storage systems, Information retrieval, Man-machine systems.
Identifiers: PDP 7 computers, IBM 1800 computers.

The report describes an interface between an IBM 1800 computer and a DEC PDP-7 computer. It has the following features: (1) it allows the transfer of blocks of data directly from the memory of one computer to the memory of the other, at up to 125,000 words per second, in parallel with program execution; (2) it allows a program running on one machine to interact asynchronously with one running on the other through a system of 'attention interrupts'; (3) it is relatively simple to control, being symmetric to both computers; (4) it compensates automatically, in either of two modes, for the difference in word length between the PDP-7 and the 1800. (Author)
AD-713 197 HC$3.00 MF$0.65

THE LEAP USER'S MANUAL,
Massachusetts Inst of Tech Lexington Lincoln Lab
Paul D. Rovner. 11 Sep 70, 101p Rept no. Lincoln manual-93 ESD-TR-70-256
Contract AF 19 (628)-5167, ARPA Order-691

Descriptors: (*Programming languages, Instruction manuals), Mathematical programming, Algebra, Algorithms.
Identifiers: LEAP programming language.

The document is a user's manual for the LEAP language. LEAP is an extended algebraic programming language which is similar in form to ALGOL. Extensions include language forms for display output and interactive input and facilities for building and manipulating associative information structures. The basic algebraic language is described, and the extensions to LEAP are presented. (Author)
AD-713 221 HC$3.00 MF$0.65

TOUCHTONE TELEPROCESSING ON THE INTERDATA 4.
Technical rept.,
Houston Univ Tex Dept of Computer Science
Darrell Van Foster, and Robert A. Sibley, Jr. Jan 70, 269p Rept no. THEMIS-RS-1-70
Contract N00014-68-A-0151

Descriptors: (*Input-output devices, Remote control systems), (*Data transmission systems, Telephone lines), Time sharing, Programming (Computers), Multiplex, Theses.
Identifiers: Touchtone telephones, Themis project.

The paper describes a teleprocessing system, (a system which processes messages transmitted and received over existing telephone communication channels), both hardware and software, which uses the 12 key touchtone telephone as the primary input/output terminal. The hardware elements are first examined collectively as a teleprocessing hardware system. Then, each of the individual hardware elements is examined and any special conditions affecting the software are explained. The software is discussed by dividing it into two functional parts, the operating system and the application for the touchtone terminal. The application selected for the touchtone telephone is that of providing the user with a non-printing desk calculator. Finally, an examination is made of this software from three points of view, the author of this paper, other similar systems, and the user at the touchtone telephone. (Author)
AD-713 241 HC$3.00 MF$0.65

VISUAL IDENTIFICATION OF PEOPLE BY COMPUTER.
Doctoral thesis,
Stanford Univ Calif Dept of Computer Science
Michael David Kelly. Aug 70, 249p Rept nos. CS-168, AI Memo-130
Contract SD-183
Report on Stanford Artificial Intelligence Project.

Descriptors: (*Humans, Identification), (*Artificial intelligence, Pattern recognition), (*Pictures, Processing), Programming (Computers), Selection, Mathematical models, Anatomical models, Optical scanning, Theses.
Identifiers: Computer printouts.

The thesis describes a computer program which performs a complex picture processing task. The task is to choose, from a collection of pictures of people taken by a TV camera, those pictures that depict the same person. The primary purpose of this research has been directed toward the development of new techniques for picture processing. (Author)
AD-713 252 HC$3.00 MF$0.65

SELCIR: SYSTEMS ENGINEERING LABORATORY CIRCUIT-DRAWING PROGRAM.
Technical rept.,
Michigan Univ Ann Arbor
James F. Blinn. Jul 70, 68p Rept nos. TR-24, SEL-TR-47
Contract DA-49-083-OSA-3050, ARPA Order-716
Report on Proj. CONCOMP. See also AD-685 631.

Descriptors: (*Circuits, Design), (*Input-output devices, Computer programs), Display systems, Cathode ray tube screens, Real time, Time sharing, Digital computers, Graphics, Man-machine systems.
Identifiers: PDP 9 computers, SELCIR computer program, *Computer graphics, Multiprogramming, *Network analysis.

SELCIR, Systems Engineering Laboratory Circuit Drawer, enables the user to draw electronic circuit diagrams on a CRT display. All graphical manipulations are performed locally in a PDP-9, which, together with a 339 display scope, forms a remote terminal to an IBM 360/67. SELCIR scans the drawn network and transmits the topology of the network diagram to the central computer. The 360 the analyzes the network and sends back results which are displayed in the form of graphs. To enable the user to express himself naturally, the graphical manipulations emphasize the user of the light pen rather than push buttons. Also the user can stop at any point to correct mistakes or make changes. Finally, many constraints on the drawing process enable him to quickly make a neat looking diagram. (Author)
AD-713 318 HC$3.00 MF$0.65

A STUDY OF DATA INPUT PROBLEMS WITHIN THE ARMY PERSONNEL INFORMATION SYSTEM,
Army Command and General Staff Coll Fort Leavenworth Kans
For primary bibliographic entry see Field 5I.
AD-713 379 HC$3.00 MF$0.65

FUNCTION APPROXIMATION ROUTINES FOR BRLESC - A SURVEY.
Memorandum rept.,
Ballistic Research Labs Aberdeen Proving Ground Md
John D. Wortman. Aug 70, 70p Rept no. BRL-MR-2053

Descriptors: (*Programming (Computers), *Curve fitting), (*Functions, *Approximation (Mathematics)), Least squares method, Dynamic programming, Interpolation, Subroutines, Reviews.
Identifiers: BRLESC computers, Spline functions, FORTRAN.

The report contains a survey of the function approximation routines available for the BRLESC computer at Aberdeen Proving Ground as of April 1969. It includes a description of each routine and some general discussion. (Author)
AD-713 396 HC$3.00 MF$0.65

LINEAR REALIZATIONS FOR PERMUTATION MACHINES,
Defence Research Telecommunications Establishment Ottawa (Ontario)

Wayne A. Davis. 1969, 7p
Availability: Pub. in Information Processing, v68 p283-289 1969. No copies furnished.

Descriptors: (*Digital computers, Computer logic), Linear systems, Shift registers, Set theory, Feedback, Canada.
Identifiers: Permutation machines, *Sequential machines.

The paper presents a method for determining if the next-state behaviour of a permutation machine is linearly realizable. Initially, a simple procedure is given for determining if a permutation machine is linear or not. The method is then extended to establish if a nonlinear machine is linearly realizable by splitting states. (Author)
AD-713 406

A SOFTWARE SYSTEM ORIENTED TO FUZE TESTING (SOSOFT),
Harry Diamond Labs Washington D C
For primary bibliographic entry see Field 19A.
AD-713 419 HC$3.00 MF$0.65

SUMMAC - A NUMERICAL MODEL FOR WATER WAVES.
Stanford Univ Calif Dept of Civil Engineering
For primary bibliographic entry see Field 8C.
AD-713 444 HC$3.00 MF$0.65

POSSIBILITY OF INCREASING THE PRODUCTIVITY OF A GENERAL-PURPOSE DIGITAL COMPUTER WHEN SOLVING ECONOMIC AND MATHEMATICAL PROBLEMS,
Foreign Technology Div Wright-Patterson AFB Ohio
L. V. Kantorovich, and Ya. I. Fet. 17 Aug 70, 8p Rept no. FTD-MT-24-107-70
Edited machine trans. of Ekonomika i Matematicheskie Metody (USSR) v5 n2 p276-279 1969, by Charles T. Ostertag.

Descriptors: (*Digital computers, Efficiency), Problem solving, Economics, Algorithms, Programming (Computers), Monte Carlo method, USSR.
Identifiers: Translations.

The authors maintain that the present general-purpose computers are inadequate for the solution of modern economic and mathematical problems, due to an apparent lack of coordination between the computing and memory units of the computers. For example, in a 3-address machine each arithmetic operation requires going into memory 4 times. Any type of computation is possible, but often the program is too bulky or inefficient. Because of this, certain types of mathematical methods, such as the Monte Carlo method, are unsatisfactory on these machines. Several ways are suggested for increasing the efficiency. One of these consists of connecting a digital general-purpose machine with a small, specialized fast computer. One arrangement worked out by the Mathematics and Economics Branch of the Mathematics Institute of the Siberian Department of the USSR Academy of Science is shown. A high rate of computation is attained by the effective use of algorithms for the arithmetic operations, the use of fixed point, and a decrease in word length. The memory section of the standard programs includes several programs. Part of this memory also provides for rewriting and serves for introducing the standard programs necessary for the solution of the problems. (Author)
AD-713 452 HC$3.00 MF$0.65

MODERNIZATION OF EGDA INSTRUMENTS AND FURTHER PROSPECTS FOR THEIR FUTURE DEVELOPMENT,
Foreign Technology Div Wright-Patterson AFB Ohio
P. F. Filchakov, and V. I. Panchishin. 4 Sep 70, 8p Rept no. FTD-MT-24-156-70
Edited machine trans. of mono. Raschet Fizicheskikh Polei Metodami Modelirovaniya (Calculation of Physical Fields by Analog Methods), Moscow, 1968 p381-384, by W. W. Kennedy.

Descriptors: (*Integrators (Computers), Design), Integration, Analog computers, Simulation, USSR.
Identifiers: EDGA analog computer, Harmonic functions, Translations.

A description is given of several models of the EGDA-type integrators developed at the Institute of Mathematics, Academy of Sciences, USSR. The use of conducting paper for simulation made it possible to develop eleven models, some of which are intended for lot production. The EGDA-9/60 is intended for solving various technical problems described by elliptic-type equations, particularly Laplace equations. Over 600 of these integrators are in use in 368 organizations in 101 cities of the Soviet Union. (Author)
AD-713 453 HC$3.00 MF$0.65

CONSIDERATIONS IN THE DESIGN OF AN XDS SIGMA 7 MULTICS.
Technical rept.,
Houston Univ Tex Dept of Computer Science
Helen Henderson, and Elliott I. Organick. Sep 69, 55p Rept no. Themis-RS-2-69
Contract N00014-68-A-0151

Descriptors: (*Data storage systems, Design), (*Programming (Computers), Multiple operation), Time sharing, Protection, Information retrieval, Safety devices, Computer storage devices, Interfaces, Control systems.
Identifiers: XDS SIGMA 7 multics, Multiprogramming, Computer privacy, Multics system, Themis project.

The paper attempts to show how a Multics-like virtual memory might be made to work on XDS (Xerox Data Systems) Sigma 7 hardware to support a multi-access multiprogrammed operating system. The body provides the basis for a feasible software design for a Sigma 7 Multics virtual memory. (Author)
AD-713 477 HC$3.00 MF$0.65

COMPUTER PROGRAMS IN OCEANOGRAPHY.
National Oceanographic Data Center Washington D C
For primary bibliographic entry see Field 8J.
AD-713 491 MF$0.65

COMPUTER OPERATED AUTOMATIC FUZE TESTING SYSTEMS,
Harry Diamond Labs Washington D C
For primary bibliographic entry see Field 19A.
AD-713 515 HC$3.00 MF$0.65

ADVANCED COMPUTATIONAL ALGORITHMS FOR LARGE SCALE, THREE DIMENSIONAL, ARTILLERY SURVEY APPLICATIONS,
Army Engineer Topographic Labs Fort Belvoir Va
For primary bibliographic entry see Field 19E.
AD-713 525 HC$3.00 MF$0.65

AUTOMATED RAW ENVIRONMENTAL DATA PROCESSING,
Army Electronics Command Fort Monmouth N J
William A. Huber. 1970, 14p

Descriptors: (*Data processing systems, Learning machines), (*Photographic intelligence, Pattern recognition), Information retrieval, Interfaces, Real time, Military intelligence, Photographic analysis, Digital computers, Adaptive systems, Visual perception.

Technology advances in military information gathering have resulted in the accumulation of large volumes of data that to be effectively utilized must be processed with a minimum time delay. Where this data is directly representative of raw environments, it generally requires human handling for filtering, classification, and subsequent generation, via keyboard, of an electrical code to effect entry into the military automatic data processing system. This manual procedure detracts from the timelessness of the data. The report presents a solution to the problem by using an adaptive learning computer system. (Author)
AD-713 543 HC$3.00 MF$0.65

USE OF MAGNETIC TAPE FOR REPORTING COST INFORMATION,
Rand Corp Santa Monica Calif
For primary bibliographic entry see Field 5A.
AD-713 606 HC$3.00 MF$0.65

HOW TO STORE IT,
Rand Corp Santa Monica Calif
B. L. Fox. Oct 70, 7p Rept no. P-4459

Descriptors: (*Programming (Computers), Operations research), Data storage systems, Management planning, Optimization, Iterations, Algorithms.
Identifiers: *Branch and bound method.

Storage layout for branch-and-bound algorithms is discussed. A composite branching rule, alternating between backtracking and branching from the point corresponding to the minimum bound, is recommended as the best compromise between reducing storage and the number of iterations. (Author)
AD-713 617 HC$3.00 MF$0.65

FEASIBILITY STUDY AUTOMATED MEDICAL EXAMINING SYSTEM STATE OF THE ART SURVEY - MEDICAL.
Philco-Ford Corp Palo Alto Calif Western Development Labs
For primary bibliographic entry see Field 6L.
AD-713 655 HC$3.00 MF$0.65

FEASIBILITY STUDY AUTOMATED MEDICAL EXAMINING SYSTEM STATE-OF-THE-ART SURVEY - DATA PROCESSING EQUIPMENT.
Philco-Ford Corp Palo Alto Calif Western Development Labs
For primary bibliographic entry see Field 6L.
AD-713 656 HC$3.00 MF$0.65

ELECTRICAL DIGITAL-ANALOG MODEL EM-10 FOR SOLVING PROBLEMS OF NONSTATIONARY THERMAL CONDUCTIVITY,
Foreign Technology Div Wright-Patterson AFB Ohio
V. E. Bukhman, B. A. Volynskii, and N. N. Makarenko. 17 Aug 70, 6p Rept no. FTD-MT-24-106-70
Edited machine trans. of mono. Raschet Fizicheskikh Polei Metodami Modelirovaniya (Calculation of Physical Fields by Methods of Modeling), Moscow, 1968 p371-374, by Charles T. Ostertag.

Descriptors: (*Analog-digital computers, Design), (*Thermal conductivity, Boundary value problems), Heat transfer, Programming (Computers), Computer storage devices, Digital-to-analog converters, USSR.
Identifiers: EM 10 computers, BESM 2 computers, Translations.

An EM-10 digital-analog model has been developed for solving nonstationary problems with boundary conditions of type 3 - the condition of heat exchange with the medium. The memory device is the magnetic drum from a BESM-2 computer. This memory device controls the entire

operation. Digital-analog converters are used to transform the numerical code into analog values. The article contains a block diagram of the EM-10 layout. (Author)
AD-713 669 HC$3.00 MF$0.65

DIGITAL COMPUTER PROGRAM FOR APPROXIMATE STRESS-CONCENTRATION ANALYSIS FOR A NOZZLE IN A SPHERICAL PRESSURE VESSEL,
Newark Coll of Engineering N J Dept of Mechanical Engineering
For primary bibliographic entry see Field 20K.
AD-713 692 HC$3.00 MF$0.65

A COMPUTER PROGRAM FOR INTERACTIVE MANIPULATION OF FINITE GROUP PRESENTATIONS.
Wisconsin Univ Madison Mathematics Research Center
For primary bibliographic entry see Field 12A.
AD-713 697 HC$3.00 MF$0.65

BEST POSSIBLE FLOATING POINT ARITHMETIC.
Wisconsin Univ Madison Mathematics Research Center
For primary bibliographic entry see Field 12A.
AD-713 699 HC$3.00 MF$0.65

RATIONAL VS. EMPIRICAL APPROACHES TO JOB/TASK DESCRIPTIONS FOR COBOL PROGRAMMERS,
Human Resources Research Organization Alexandria Va
For primary bibliographic entry see Field 5I.
AD-713 716 HC$3.00 MF$0.65

FORMAT--FORTRAN MATRIX ABSTRACTION TECHNIQUE. VOLUME V-SUPPLEMENT 1. ENGINEERING USER AND TECHNICAL REPORT--EXTENDED.
Douglas Aircraft Co Long Beach Calif
For primary bibliographic entry see Field 20K.
AD-713 727 HC$3.00 MF$0.65

AUTOMATION OF PERSONNEL PERFORMANCE EVALUATION DATA: A STUDY.
System Development Corp Santa Monica Calif
For primary bibliographic entry see Field 5I.
AD-713 729 HC$3.00 MF$0.65

OF COMPUTERS AND SLEEP.
Navy Medical Neuropsychiatric Research Unit San Diego Calif
For primary bibliographic entry see Field 6P.
AD-713 730 HC$3.00 MF$0.65

POSSIBILITIES OF APPLYING A DIGITAL ASSOCIATIVE MACHINE IN INFORMATION PROCESSING METHODS,
Foreign Technology Div Wright-Patterson AFB Ohio
E. A. Bratalskii, and R. V. Tveritskii. 9 Sep 70, 15p Rept no. FTD-MT-24-95-70
Edited machine trans. of Mekhanizatsiya i Avtomatizatsiya Upravleniya (USSR) n6 p56-58 1968, by W. W. Kennedy.

Descriptors: (*Data processing systems, Design), Computer storage devices, Digital computers, Efficiency, USSR.
Identifiers: Translations, *Associative storage.

The possibilities of special associative memory computers are considered as an aid in certain forms of information processing. It is proposed that a digital associative machine be devised which would perform non-computational tasks on massive volumes of input data, such as sorting, searching, or tagging, and thus relieve the general-purpose computer of these time-consuming operations. Block diagrams are given, and a typical sorting program using a digital associative machine is described. Operating on a word of m bits simultaneously against n reference standards increases the handling speed by at least (n) x (m) times, compared to the standard computer. Sorting speeds can thus be increased by 100-200 times, and operation speeds of a given sec are foreseen. The digital associative machine concept would be most useful in real-time operations where a real high-volume flow of information must be handled. (Author)
AD-713 769 HC$3.00 MF$0.65

MEI-2 SYNTACTICAL TRANSLATOR,
Foreign Technology Div Wright-Patterson AFB Ohio
G. V. Peledov. 12 Aug 70, 10p Rept no. FTD-HT-23-402-70
Edited trans. of Seminar Avtomatizatsiya Programmirovaniya. Doklady (USSR) n1 p80-85 1968, by L. Thompson.

Descriptors: (*Machine translation, Programming (Computers)), Algorithms, Programming languages, Subroutines, Syntax, Compilers, USSR.
Identifiers: Translations, MEI 2 syntactical translator, MINSK 22 computers, ALGAMS programming language.

A brief description is given of the MEI-2 syntactical translator, which was designed at the Moscow Power Engineering Institute for operation with the Minsk-22 computer. The input language is a shortened version of ALGAMS, which is in turn derived from ALGOL-60. The internal language is based on pseudo-instructions including those for 'sign,' 'operation,' 'index,' and 'address.' Operations included are arithmetical, address, logic, transfer, control, and access to subroutine. Translation is obtained from a syntactical compiler which comprises analytic and synthetic functions. In the analytic step, the incoming language is parsed according to the programmed syntactical rules, thus generating a syntactical tree. The synthetic operation is governed by semantic rules, in accordance with which an output sequence of symbols is generated which conforms to the required syntax. A continuous debugging routine is included, examples of which are described. (Author)
AD-713 771 HC$3.00 MF$0.65

SEVERAL STRUCTURAL METHODS FOR INCREASING THE PRODUCTIVITY OF DIGITAL COMPUTERS,
Foreign Technology Div Wright-Patterson AFB Ohio
E. A. Aleksandrov, and N. V. Smolkotin. 13 Aug 70, 14p Rept no. FTD-MT-24-79-70
Edited machine trans. of Statisticheskoi i Elektronno-Vychislitelnoi Tekhniki v Elektronike. Sbornik (USSR) v1 p288-294 1966, by Charles T. Ostertag.

Descriptors: (*Digital computers, Performance (Engineering)), Algorithms, Interfaces, Syntax, Computer logic, Programming (Computers), Design, Data transmission systems, USSR.
Identifiers: Translations, Parallel processors.

Many structural methods of improving the productivity and operational potentialities of digital computers can be subdivided into two fundamental groups: the development of new structures of programing and initial languages and the development of structural schemes of interconnections between units in the computer. A tentative classification is offered of various structures widely used at present. The parallelism methods, that is, all the methods from joint elementary machine operations to simultaneous filling several programs belonging to different problems, are briefly examined. The following new concepts in the structural organization of digital computers are briefly considered: organization of a fixed structure, organization of a unitized structure, organization of a program-changed structure, and a self-organized structure. (Author)
AD-713 773 HC$3.00 MF$0.65

THE SYSTEM FACILITY OF AN ELEMENTARY MACHINE OF THE 'MINSK 222' COMPUTER SYSTEM,
Foreign Technology Div Wright-Patterson AFB Ohio
G. P. Lopato, A. N. Vasilevskii, V. Ya. Pykhtin, B. A. Sidristyi, and V. G. Khoroshevskii. 9 Sep 70, 33p Rept no. FTD-MT-24-118-70
Edited machine trans. of Vychislitelnye Sistemy (USSR) n23 p35-67 1966, by K. L. Dion.

Descriptors: (*Data processing systems, Digital computers), Data transmission systems, Input-output devices, Interfaces, Design, Control systems, Synchronization, Information retrieval, USSR.
Identifiers: *MINSK 22 computers, Translations.

The system facility of an elementary machine of the Minsk 222 computer system is described as the functional units which carry out the commands of the system. These commands include the commands of transmission, input, set-up, and general unconditional transfers, and are associated with the shifting of information among elementary machines. This facility also handles the intermachine transfer of operating information. The facility consists of three basic units: a commutator, a set-up register, and systems operations unit. The commutator is composed of a commutation circuit handling the working channel, priority channel, and a synchronization channel, all of which are of the impulse type. The set-up register has a record for the current partition or subsystem of operation, as well as a circuit of potential cores for control. The systems operations unit contains an operations decoder, a central distributor of impulses, a link with the operating memory unit, a command address retriever, links with peripheral units and with the control console, register controls, control transfer devices, and a tape address calculator. The facility arrangements are discussed in some detail. (Author)
AD-713 776 HC$3.00 MF$0.65

SEVERAL QUESTIONS IN THE SELECTION OF STRUCTURE OF FLIGHT CONTROL COMPUTERS,
Foreign Technology Div Wright-Patterson AFB Ohio
V. A. Popov, and N. T. Berezyuk. 17 Aug 70, 12p Rept no. FTD-MT-24-108-70
Edited machine trans of Samoletostroenie i Tekhnika Vozdushnogo Flota (USSR) n12 p52-55 1967, by Charles T. Ostertag.

Descriptors: (*Special purpose computers, *Flight control systems), Algorithms, Real time, Computer logic, Reliability (Electronics), Digital differential analyzers, Digital computers, USSR.
Identifiers: Translations.

A mathematical approach is proposed for selecting optimum computers for flight control systems on the basis of their speed of computation, their productivity, and their effectiveness. It is stated at the beginning that only digital computers should be considered. The computers should be selected to suit the best for a certain class of problems. The speed is defined as the number of average operations performed in a unit of time during the solution of a typical problem and it can be expressed by a given equation. This method does not take into account the complexity of particular operations which can be taken care of by introducing a universal algorithmic unit of problem complexity. The given equation would change. Since the speed may vary from problem to problem, it is necessary to find a nom for a group of problems representing the certain class for which the computer is being selected. At a given reliability in solving a certain group of problems, the mathematical expectation of a random quantity is defined. The productivity

can be defined as the ratio of the volume of calculating tasks required to solve a problem to the time lost in solving the problem. It can be expressed by a given equation. (Author)
AD-713 786 HC$3.00 MF$0.65

THE PROGRAM INTERRUPTION ROUTINE FOR THE ELECTRONIC COMPUTER DNEPR 1,
Foreign Technology Div Wright-Patterson AFB Ohio
E. P. Dmitriev, and A. V. Smirnova. 21 Aug 70, 12p Rept no. FTD-MT-24-80-70
Edited machine trans. of Seminar Upravlyayushchie Mashiny i Sistemy. Trudy (USSR) v2 p19-25 1966, by K. L. Dion.

Descriptors: (*Programming (Computers), Digital computers), (*Telephone signals, Data processing systems), (*Telegraph signals, Data processing systems), Data transmission systems, Telephone lines, Input-output devices, Telegraph systems.
Identifiers: Dnepr 1 computers, Translations.

Circuit schemes and subroutine programs are described for the computer 'Dnepr-1', which permit one to realize an interruption mode for effectively inputting new information arriving along telephone and telegraph communication channels. At the arrival of a signal, two machine states are possible: (a) computation in accordance with the main program, and (b) stop. Depending upon this condition two interruption modes are distinguished. A description is given of the operation of the circuit scheme and subroutine program which effect the input of information and the return to the principal program where it was interrupted. (Author)
AD-713 787 HC$3.00 MF$0.65

FORMAT-FORTRAN MATRIX ABSTRACTION TECHNIQUE. VOLUME VII--SUPPLEMENT I. DESCRIPTION OF DIGITAL COMPUTER PROGRAM--PHASE III--EXTENDED.
Douglas Aircraft Co Long Beach Calif
For primary bibliographic entry see Field 20K.
AD-713 840 HC$3.00 MF$0.65

DATA PRESENTATION SYSTEM, USER'S MANUAL.
Computer system manual,
IBM Federal Systems Div., Gaithersburg, Md.
R. A. Wachter. 17 Jun 68, 283p NMCSSC-CSM-UM-39-68
Contract DCA100-67-C-0037
Distribution Limitation now Removed.

Descriptors: (*Data processing systems, Instruction manuals), Southeast Asia, Input-output devices, Plotters, Display systems, Programming (Computers), Punched cards.
Identifiers: National military command system, Data presentation system, IBM 1403 printers, CALCOMP plotters.

The Data Presentation System was developed to support the analysis activity carried on by the Office of the Assistant Secretary of Defense for Systems Analysis, Southeast Asia Programs Division. It provides a flexible capability for presenting processed data quickly in a variety of output forms for analysis and publication. The system interfaces with the NMCS Information Processing System (NIPS), retaining the full and powerful capability of NIPS, and provides a three dimensional facility for presenting data. Matrix reports are provided on the IBM 1403 Printer for detailed analaysis. Management graphs are generated on the CALCOMP Plotter for a quick look analysis and publication. Geographic displays are prepared for CALCOMP plotting for a unique kind of analysis and publication. (Author)
AD-844 551 HC$3.00 MF$0.65

THE BAYESIAN APPROACH TO IDENTIFICATION OF A REMOTELY SENSED ENVIRONMENT.
Kansas Univ., Lawrence. Center for Research.
For primary bibliographic entry see Field 8B.
AD-860 060 HC$3.00 MF$0.65

COMPUTER ELEMENTS AND SYSTEMS. NUMBERS 29-31, 1968 (COLLECTION OF PAPERS).
National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

1970, 291P SFCSI-AEC (TT-70-50011), TT-70-50011
Trans. of Vychislitelnye Sistemy (USSR) n29/31 386p 1968, by A. Barouch, and D. Louvish.

Descriptors: (*Digital computers, USSR), Semiconductor devices, Thin film storage, Design, Algorithms, Dielectric films, Nonlinear differential equations, Power reactors (Nuclear), Monte carlo method, Computerized simulation, Computer logic.
Identifiers: MINSK 222 system.

Contents: Variational Methods for the Experimental Study of Kinetic Coefficients in Semiconductors; On the Possibility of Creating a Dynamic System for Film Deposition; Some Molecular-Kinetic Characteristics of Thermal Evaporators; Closed Intermittent Thermal Evaporators for the Vacuum Deposition of Films; On the Crystallization Mechanism of Thin Layers; On the Current Flow in Thin-Film Sandwiches; On the Electric Breakdown of Dielectric Films; On the Anomalous Strength of Aluminum Condensed in Vacuum; A P-Algorithm for Solution of Systems of Nonlinear Equations; Computer-System Solution of a System of Linear Equations; Investigation of Oscillatory Processes in Conveyors on the MINSK-222 System; Multigroup Computation of a Two-Dimensional Reactor in the Diffusion Approximation on a MINSK-222 System; Thermodynamic Computation of Gas Cycles of Nuclear Power Stations Using Dissociating Gases on the MINSK-222 System; Length-and-Breadth 'Chasing' on the MINSK-222 Computer System; Monte Carlo Simulation of Inelastic Scattering of Electrons; Solution of the Problem of Energy Dissipation in Ionizing Radiation by the Monte Carlo Method on the MINSK-222 System.
AEC-tr-7104 HC$3.00 MF$0.65

THE QUAD SCHEME: A NEW METHOD FOR PHASE SPACE INTEGRATION,
Argonne National Lab., Ill.
For primary bibliographic entry see Field 20L.
For abstract, see NSA 24 20.
ANL-7556 HC$3.00 MF$0.65

ADEP-1 AND ADEP-2: ONE-AND TWO-DIMENSIONAL FEW-GROUP KINETICS CODES,
Battelle Memorial Inst., Columbus, Ohio.
For primary bibliographic entry see Field 18K.
For abstract, see NSA 24 20.
BMI-1888 HC$3.00 MF$0.65

RELAPS: A COMPUTER PROGRAM FOR REACTOR BLOWDOWN ANALYSIS,
Idaho Nuclear Corp., Idaho Falls.
For primary bibliographic entry see Field 18I.
For abstract, see NSA 24 20.
IN-1321 HC$3.00 MF$0.65

DIGITAL COMPUTATION OF POWER SPECTRAL DENSITY CURVES FROM REACTOR NOISE DATA,
Idaho Nuclear Corp., Idaho Falls.
For primary bibliographic entry see Field 18K.
For abstract, see NSA 24 20.
IN-1374 HC$3.00 MF$0.65

AUTOMATED SYSTEM OF MEDICAL DATA PROCESSING,
Joint Publications Research Service, Washington, D.C.
For primary bibliographic entry see Field 6L.
JPRS-51598 HC$3.00 MF$0.65

SIGNIFICANT DIGIT ARITHMETIC ON A CDC 6600,
Los Alamos Scientific Lab., N. Mex.
V. Gardiner, and N. Metropolis. Jun 70, 4p
Contract W-7405-eng-36

Descriptors: (*Arithmetic, Computer programming), Error analysis, Addition, Subtraction, Multiplication, Division, FORTRAN, Exponents, Square roots, Logarithm functions, Precision, Algorithms, Digital computers.
Identifiers: CDC 6600 computers.

For abstract, see NSA 24 20.
LA-4470 HC$3.00 MF$0.65

AN ITERATIVE CHAIN PROGRAM SYSTEM FOR SPECTRUM ANALYSIS BY THE PDP-9.
Ein Interpretatives Teilprogrammsystem Zur Spektrenbearbeitung Auf Der Pdp-9
Hahn-meitner-institut Fur Kernforschung, Berlin (West Germany).
W. Busse, R. Michaelsen, and R. Schintke. Jul 70, 86p HMI-B-94, B-NDV3
Lang- in German

Descriptors: *Computer programs, *Pdp 9 computer, *Spectrum analysis, Data reduction, Iteration.

For abstract, see STAR 08 21.
N70-38300 HC$3.00 MF$0.65

BATTELLE INFORMATION NUMBER 3.
Battelle Inst., Frankfurt Am Main (West Germany).
Jan 69, 47p

Descriptors: *Computer storage devices, *Explosive welding, *Metal-metal bonding, *Microminiaturization, *Whisker composites, *Wire, Flat plates, Metal plates, Reinforcing fibers, Whiskers (single crystals).

For abstract, see STAR 08 21.
N70-38648 HC$3.00 MF$0.65

REQUIREMENTS ANALYSIS FOR A MANNED SPACEFLIGHT PROGRAMMING LANGUAGE AND COMPILER.
Intermetrics, Inc., Cambridge, Mass.
For primary bibliographic entry see Field 22A.
For abstract, see STAR 08 21.
N70-38950 HC$3.00 MF$0.65

ON-LINE PROGRAMMING SYSTEM.
Wolf Research and Development Corp., Bedford, Mass.
Sep 70, 57p NASA-CR-1647
Contract NAS5-9756-149
Coll- 57 P Refs

Descriptors: *Assembly language, *Man machine systems, *On-line programming, *Univac 1108 computer, Computer graphics, Display devices, Problem solving.

For abstract, see STAR 08 21.
N70-38955 HC$3.00 MF$0.65

COMPUTER HANDLING OF REACTOR DATA FOR SAFETY: CHORD-S,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 18I.
For abstract, see NSA 24 20.
ORNL-TM-2928 HC$3.00 MF$0.65

PREDICTION OF MOISTURE MOVEMENT IN EXPANSIVE CLAYS.
Texas Univ., Austin. Center for Highway Research.
For primary bibliographic entry see Field 8H.
PB-194 910 HC$3.00 MF$0.65

BEDLOAD FORMULAS. PART A. A SELECTION OF BEDLOAD FORMULAS. PART B. PROGRAM LISTINGS FOR BEDLOAD FORMULAS.
Pennsylvania State Univ., University Park. Dept. of Civil Engineering.
For primary bibliographic entry see Field 8H.
PB-194 950 HC$3.00 MF$0.65

BRIEF DESCRIPTIONS OF AND EXAMPLES OF OUTPUT FROM COMPUTER PROGRAMS DEVELOPED FOR USE WITH WATER DATA IN KANSAS,
Kansas Geological Survey, Lawrence.
For primary bibliographic entry see Field 13B.
PB-194 969 HC$3.00 MF$0.65

HUMAN RESOURCES MANAGEMENT SYSTEM AND PROGRAM INITIATION. MANUAL A-MODEL 1.1.
Ozarks Regional Commission.
For primary bibliographic entry see Field 5I.
PB-195 033 HC$3.00 MF$0.65

HUMAN RESOURCES MANAGEMENT SYSTEM. LABOR AVAILABILITY SURVEY. JOB AVAILABILITY SURVEY. LABOR/JOB MATCHING. MANUAL C-MODELS 1.3, 1.4, 1.5.
Ozarks Regional Commission.
For primary bibliographic entry see Field 5I.
PB-195 035 HC$3.00 MF$0.65

HUMAN RESOURCES MANAGEMENT SYSTEM. OCCUPATIONAL EDUCATION MODEL. MANUAL D, MODEL 1.6.
Ozarks Regional Commission.
For primary bibliographic entry see Field 5I.
PB-195 036 HC$3.00 MF$0.65

SURVEY DATA TAPE, CLEVELAND-HOPKINS AIRPORT ACCESS STUDY.
Regional Planning Commission, Cleveland, Ohio.
For primary bibliographic entry see Field 13B.
PB-195 050 HC$55.00

THE PRAGMATICS OF COMPUTER SCHEDULING.
Research rept.,
Georgia Inst. of Tech., Atlanta. School of Information and Computer Science.
John M. Hoffman. 1970, 17p GITIS-70-10
Grant NSF-GN-655

Descriptors: (*Data processing, Time sharing), (*Computer programming, Scheduling), Work input control, Sequencing.

The paper attempts to provide the motivation for a pragmatic schema which will characterize and formalize the interaction which takes place between a time-sharing computer system and the users of the system. It is hoped that the work discussed in the paper will lead to the development of an 'environmental scheduling' procedure which will ensure that, from a given mix of user programs, the operating system software will receive only those programs which can be processed most efficiently (under some specified operational policy). (Author)
PB-195 135 HC$3.00 MF$0.65

A PERSONNEL MANAGEMENT INFORMATION SYSTEM.
Georgia Inst. of Tech., Atlanta. School of Information and Computer Science.
For primary bibliographic entry see Field 5I.
PB-195 136 HC$3.00 MF$0.65

THE AUDIOGRAPHIC LEARNING FACILITY: OBJECTIVES AND DESIGN.
Georgia Inst. of Tech., Atlanta. School of Information and Computer Science.
For primary bibliographic entry see Field 5I.
PB-195 137 HC$3.00 MF$0.65

SIMULATION OF OPERATING SYSTEMS.
Research rept.,
Georgia Inst. of Tech., Atlanta. School of Information and Computer Science.
Robert C. Roehrkasse, and Wayne D. Smith. 1970, 27p GITIS-70-11
Grant NSF-GN-655

Descriptors: (*Data processing, Computerized simulation), Performance tests, Decision making, Evaluation, Mathematical models, Central processing units, Input output devices (Computers).
Identifiers: PDP 8/1 computers.

Simulation is used to evaluate proposed designs for a PDP-8/1 operating system. Measures of performance are developed from a set of time-dependent factors for which statistics are accumulated during the simulation. A formal structure for the simulation model is described and rigorously defined. The project represents a case study in the role of simulation in the decision/evaluation process. (Author)
PB-195 138 HC$3.00 MF$0.65

OMNITAB II MAGNETIC TAPE AND DOCUMENTATION PARCEL.
Final rept.,
National Bureau of Standards, Washington, D.C. Applied Mathematics Div.
David Hogben, Sally T. Peavy, and Ruth N. Varner. Oct 70, 1 reel magnetic tape NBS-Magnetic Tap
Specify tap ing mode desired: 7 or 9 track, 556 or 800 B even parity. (Note: 9 track is available only in 800 BPI odd parity).

Descriptors: (*Computer programming, Data processing), Statistical analysis, Bessel functions, Numerical analysis, Algorithms, Complex variables, English language, Matrices (Mathematics), Thermodynamics, Magnetic tapes, Computer programs.
Identifiers: OMNITAB 2 computer program, ANSI FORTRAN programming language.

The paper constitutes the release of the OMNITAB 2 general-purpose computing system to the public. The parcel consists of a magnetic tape and four publications which are the documentation for OMNITAB 2. A brief description is given here of OMNITAB 2, the magnetic tape and the associated documentation. (Author)
PB-195 150 $250.00

COMPUTER SOFTWARE CHARACTERISTICS OF THE AUDIOGRAPHIC LEARNING FACILITY,
Georgia Inst. of Tech., Atlanta. School of Information and Computer Science.
David E. Wright. 30 Sep 70, 38p GITIS-70-07
Grant NSF-GN-655

Descriptors: (*Computer systems programs, Education), (*Information retrieval, Remote control), Learning, Programming languages, Command and control, Telephone systems, Flow charts, Tape recording, Scheduling, Adaptive systems.
Identifiers: Computer aided instruction, *Audiographic learning facilities, PDP 8/1 computers, Man computer dialogs.

The report provides a description of the remote audiographic learning facility software as presently implemented on a PDP 8/1 digital computer at the Georgia Institute of Technology. Program listings are maintained at the School of Information and Computer Science. (Author)
PB-195 157 HC$3.00 MF$0.65

TRANSPORT/360: A COMPUTER PROGRAM FOR DESIGNING CHARGED PARTICLE BEAM TRANSPORT SYSTEMS,
Stanford Linear Accelerator Center, Calif.
For primary bibliographic entry see Field 20G.
For abstract, see NSA 24 20.
SLAC-91 HC$3.00 MF$0.65

A COMPUTER PROGRAM FOR THE SMOOTHING AND DIFFERENTIATION OF DATA FROM MULTICHANNEL ANALYZERS,
California Univ., Berkeley. Lawrence Radiation Lab.
For primary bibliographic entry see Field 18D.
For abstract, see NSA 24 20.
UCRL-19903 HC$3.00 MF$0.65

WEAPONS EFFECTS DISPLAY SYSTEM (WEDS MOD II): ROM ACCESSORY USER'S MANUAL,
California Univ., Livermore. Lawrence Radiation Lab.
D. J. Peschel. 10 Jun 70, 35p

Descriptors: (*Data processing equipment, Display devices), (*Nuclear explosion effects, Display devices), Manuals.
Identifiers: Weapons effects display system.

For abstract, see NSA 24 20.
UCRL-50892 (Vol.3) HC$3.00 MF$0.65

APPLICATION OF CLASSICAL INDUSTRIAL ENGINEERING TECHNIQUES TO SYSTEMS ENGINEERING,
Bettis Atomic Power Lab., Pittsburgh, Pa.
For primary bibliographic entry see Field 5A.
For abstract, see NSA 24 20.
WARD-T-2311 HC$3.00 MF$0.65

9C. Electrical and Electronic Engineering

TAETIGKEITSBERICHTE 1969. FACHGEBIET 5: ELEKTRONIK (Activity Report 1969. Division 5. Electronics),
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Porz-Wahn (West Germany)
Guenther Ulbricht, and Philipp Hartl. 1969, 21p
Text in German.
Availability: Pub. in Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt-Jahresbericht 1969 21p. No copies furnished.

Descriptors: (*Space flight, Communication systems), (*Aeronautics, Communication systems), (*Electronics, Scientific research), Radio communication systems, Microwave communication systems, Radio navigation, Telemeter systems, Air traffic control systems, All-weather aviation, Aircraft, Satellites (Artificial), West Germany.

The Institut fur Flugfunk und Mikrowellen studies problems of electronics in aviation and space flight, consequently the technique of information and signal transmission in the high-frequency range in the broadest sense. Part of this field are radio detection and radio navigation inclusive certain problems of trajectory determination of flying bodies, telemetry air traffic control and problems concerning all-weather landing. The Institut fur Satellitenelektronik especially deals with experimental and theoretical work for space borne electronics. (Author)
AD-713 211

STATIC SYSTEM FOR THE AUTOMATIC CONTROL OF ELECTRIC DRIVE.
Naval Intelligence Command Alexandria Va Translation Div
14 Oct 70, 96p Rept no. NIC-TRANS-3125
Trans. of mono. Beskontaktnye Sistemy Avtomaticheskogo Upravleniya, n. p., 1968 p189-192, 195-197, 202-221, 243-271, 275-300.

Descriptors: (*Electric motors, Speed regulators), (*Speed regulators, Automatic), Thyratrons, Rotary switches, Rectifiers, Servomechanisms, Circuits, Wiring diagrams, USSR.
Identifiers: Translations, Automatic control.

Another paper reviewed the circuitry for automatically controlling the processes involved in starting and braking direct and alternating current motors by relay-contact equipment. Speed regulation was accomplished by inserting resistance in the motor armature or rotor circuits. But it is known that this speed regulation method causes a deterioration in mechanical characteristics and motor speed to become unstable, depending on the load. When the drive is required on the one hand to provide broad and smooth speed regulation, and on the other to maintain an assigned speed, regardless of load, recourse is had to closed automatic speed regulation systems using various types of electrical machines, and magnetic, electronic, and semiconductor components. Drives, the bases of which are contactless magnetic and semiconductor components, and particularly controlled tubes (thyratrons), have an especially good future.
AD-713 386 HC$3.00 MF$0.65

BULLETIN OF THE RADIO AND ELECTRICAL ENGINEERING DIVISION OF THE NATIONAL RESEARCH COUNCIL OF CANADA. VOLUME 20, NUMBER 2, APRIL-JUNE 1970.
National Research Council of Canada Ottawa (Ontario) Radio and Electrical Engineering Div

Jun 70, 57p
Availability: Pub. in Bulletin of the Radio and Electrical Division, National Research Council of Canada, Ottawa, Ontario. v20 n2 p1-54 Jun 70. No copies furnished.

Descriptors: (*Scientific research, Canada), Safety, Hazards, Hospitals, Electrical engineering, Comparators, Vacuum, Ionization, Hydrogen, Adsorption, Ion bombardment, Boundary value problems, Partial differential equations, Feathers, Antennas, Radio astronomy, Music, Computers.
Identifiers: Announcement bulletins.

Contents: Electrical hazards in hospitals; The application of the direct current comparator to resistance thermometry; Ultra-high vacuum technology; Electron-gas collision studies; Surface science; The Rayleigh hypothesis and singularities of solutions to the Helmholtz equation; Bird feathers as dielectric rod antennas; Radar observation of the 1969 Leonid meteor shower; A summary on the design study of nearly optimum supersynthesis antenna arrays; LBI observations, Puerto Rico - ARO; Electronic music; Computer aid for musical composers.
AD-713 683

EFFECT OF ATMOSPHERIC HUMIDITY ON BREAKDOWN VOLTAGE OF VARIOUS SPARKOVER LENGTHS AT VARIOUS VOLTAGE FORMS.
Einfluss Der Luftfeuchtigkeit Auf Die Durchbruchspannung Verschiedener Funkenstrecken Bei Verschiedenen Spannungsformen
Eidgenossische Technische Hochschule, Zurich (Switzerland).
M. S. Guindehi. 1970, 140p DISS-4347
Lang- in German

Descriptors: *Atmospheric moisture, *Electrical faults, *Spark gaps, Electric potential, Flashover.
For abstract, see STAR 08 21.
N70-38345 HC$3.00 MF$0.65

9D. Information Theory

AN EXACT SOLUTION TO AN ADAPTIVE LINEAR ESTIMATION PROBLEM,
Frank J Seiler Research Lab United States Air Force Academy Colo
Kenneth D. Senne. Sep 70, 37p Rept no. SRL-TR-70-0014

Descriptors: (*Information theory, Decision theory), Adaptive systems, Control systems, Integral equations, Algorithms, Theorems, Theses.
Identifiers: Estimation theory, Time varying systems, Wiener-Hopf equations.

An exact analysis of a particular form of adaptive estimator is presented. The result is the explicit evolution of the mean square estimation errors in general time-varying environments, as well as necessary and sufficient conditions for convergence of the estimates and explicit corresponding solutions in the presence of step changes in signal statistics. The estimator in question involves a gradient-following algorithm for recursively computing the solution to a discrete aprroximation to the Wiener-Hopf integral equation. The term adaptive is used to indicate that the gradient-following is permitted to continue indefinitely resulting in the capability of adjusting to sudden or unexpected evolutionary changes in process statistics at any time. Convergence of the estimates is defined in terms of the fractional excess mean square error or misadjustment maintained by the random estimator weights. Adaptive estimator convergence is intentionally weaker than stochastic approximation convergence so that precise knowledge of the time-varying nature of f the statistics is not required in order to obtain satisfactory mean-square-error performance. The specific problem which is analyzed exactly involves zero-mean, mutually gaussian distributed, independent sample vectors. The assumption of intersample independence is in part justified by the detailed analytical results which provide for the first time a prototype for the synthesis of adaptive estimators suitable for truly nonstationary environments. (Author)
AD-713 098 HC$3.00 MF$0.65

AN EXPANDED CHARACTERIZATION OF THE INFORMATION CAPACITY OF A SHORT RANGE UNDERWATER COMMUNICATIONS CHANNEL.
George Washington Univ Washington D C School of Engineering and Applied Science
For primary bibliographic entry see Field 17B.
AD-713 146 HC$3.00 MF$0.65

STUDY OF COMPUTER GRAPHICS AND SIGNAL CLASSIFICATION APPLICATIONS.
General Electric Co Syracuse N Y Electronics Lab
For primary bibliographic entry see Field 9B.
AD-713 155 HC$3.00 MF$0.65

ON THE CONSTRUCTION OF A CLASS OF MAJORITY-LOGIC DECODABLE CODES,
Hawaii Univ Honolulu Dept of Electrical Engineering
Tadao Kasami, and Shu Lin. 15 Jun 70, 41p Rept no. Scientific-2 AFCRL-70-0430
Contract F19628-70-C-0082

Descriptors: (*Coding, Design), (*Decoding, Mathematical models), Set theory, Vector spaces, Graphics, Theorems.
Identifiers: *Majority logic decoding, Block codes, Cyclic codes.

The attractiveness of majority-logic decoding is its simple implementation. Several classes of majority-logic decodable block codes have been discovered for the past two decades. In this paper, a method of constructing a new class of majority-logic decodable block codes is presented. Each code in this class is formed by combining majority-logic decodable codes of shorter lengths. A procedure for orthogonalizing codes of this class is formulated. For each code, a lower bound on the number of correctable errors with majority-logic decoding is obtained. An upper bound on the number of orthogonalization steps for decoding each code is derived. Some majority-logic decodable codes which have more information digits than the Reed-Muller codes of the same length and the same minimum distance are found. Some results presented in this paper are extensions of the results of Lin and Weldon and Gore on the majority-logic decoding of direct product codes. (Author)
AD-713 184 HC$3.00 MF$0.65

APPLICATION OF WALSH TRANSFORM TO STATISTICAL ANALYSIS,
California Univ Los Angeles School of Engineering and Applied Science
For primary bibliographic entry see Field 12A.
AD-713 194 HC$3.00 MF$0.65

BOUNDS AND ASYMPTOTES FOR THE PERFORMANCE OF MULTIVARIATE QUANTIZERS,
Massachusetts Inst of Tech Cambridge Research Lab of Electronics
For primary bibliographic entry see Field 12A.
AD-713 750

SIGNAL-DESIGN CONSIDERATIONS FOR THE NONCOHERENT GAUSSIAN CHANNEL,
University of Southern California Los Angeles
M. S. Stone, and C. L. Weber. 20 Jan 70, 4p
AROD-7198:21-RT
Grants DA-ARO-D-31-124-70-G51, DA-ARO (D)-31-124-G1045
Prepared in cooperation with TRW Systems Group, Redondo Beach, Calif. Revision of report dated 14 Oct 69.
Availability: Pub. in IEEE Transactions on Information Theory, Correspondence, p501-503 Jul 70.

Descriptors: (*Information theory, Signal-to-noise ratio), Mathematical models, Transmitter-receivers, Narrowband, Optimization, Theorems.
Identifiers: *Signal design, Telecommunication.

The choice of M equiprobable equipowered narrowband waveforms of equal duration for the noncoherent communication system is considered. With the bandwidth constrained, the problem of finding optimal signal sets of given dimension is formulated as a variational one. For dimensionality D = or < 2M - K, K = or < 2 (M/3), where () denotes 'integer part of,' and M = or > 6, signal inner-product matrices consisting of K regular simplices placed mutually orthogonal to one another, are local extremals of the probability of error, thereby establishing a marked similarity between the coherent and noncoherent signal-design problems. (Author)
AD-713 781

THE BAYESIAN APPROACH TO IDENTIFICATION OF A REMOTELY SENSED ENVIRONMENT.
Kansas Univ., Lawrence. Center for Research.
For primary bibliographic entry see Field 8B.
AD-860 060 HC$3.00 MF$0.65

MULTI-IMAGE PATTERN RECOGNITION: IDEAS AND RESULTS.
Kansas Univ., Lawrence. Center for Research.
For primary bibliographic entry see Field 8B.
AD-863 596 HC$3.00 MF$0.65

TWO CONTRIBUTIONS TO THE THEORY OF DIGITAL FILTERING,
Idaho Nuclear Corp., Idaho Falls.
A. L. Connelly. Jul 70, 37p

Contract AT (10-1)-1230

Descriptors: (*Communication theory, *Digital filters), Fourier transformation, Autocorrelation, Power spectra, Cross correlation, Spectrum analysis.
Identifiers: *Filtering theory.

For abstract, see NSA 24 20.
IN-1411 HC$3.00 MF$0.65

9E. Subsystems

ULTRA-STABLE MICROWAVE CAVITY.
Final rept. Jun 69-Jun 70,
Corning Glass Works Raleigh N C Electronic Research Lab
J. R. Kim, J. J. Pan, and J. Singletary. Aug 70, 104p Rept no. P-41-14 RADC-TR-70-158
Contract F30602-69-C-0049

Descriptors: (*Cavity resonators, *Microwave oscillators), Oscillators, Transistors, Stability, Optimization, S band, Avalanche diodes, Integrated circuits.

The report covers the development of stable fundamental microwave sources which derive their frequency stability from resonators made of very low thermal expansion glass and glass-ceramic materials. Three different source configurations at L-, S-, and X-bands were analyzed and constructed. The resonator feedback source was selected as the principal type. Computer optimization of an S-band source circuit of this type resulted in a measured source temperature stability of plus or minus 1.88 x 10 to the minus 7 power parts/C over the -25C to +75C temperature range. This is in substantial agreement with the calculated stability. This source showed a frequency stability plus or minus 9 x 10 to the minus 9 power parts/hour when averaged over a 34-hour period in a constant environment. (Author)
AD-713 127 HC$3.00 MF$0.65

ANALYSIS AND DESIGN OF WIRE ANTENNAS WITH APPLICATIONS TO EMC,
Syracuse Univ N Y Dept of Electrical Engineering
Bradley J. Strait, and Arlon T. Adams. 26 May 69, 16p Rept no. Scientific-8 AFCRL-70-0499
Contracts F19628-68-C-0180, AF 30 (602)-2636
Sponsored in part by Contract F30602-68-C-0086.
Availability: Pub. in IEEE Transactions on Electromagnetic Compatibility, vEMC12 n2 p45-54 May 70.

Descriptors: (*Antennas, Electromagnetic compatibility), Wire, Design, Analysis, Antenna arrays, Field theory, Radiofrequency interference, Antenna radiation patterns.

The method of moments is applied to wire antennas. Antenna analysis and beam pattern synthesis methods are outlined. Constraints appropriate to problems of EMC can readily be introduced. Some of the subjects treated are coupling, parasitic effects, pattern synthesis, null placement, and gain maximization. Numerous examples are given to illustrate the theory. (Author)
AD-713 246

A DUAL OUTPUT 1.6 GHz SOLID-STATE POWER SOURCE.
Technical rept.,
Royal Aircraft Establishment Farnborough (England)
B. Lake. Jan 70, 17p Rept no. RAE-TR-70002 TRC-BR-18664

Descriptors: (*Frequency multipliers, Semiconductor devices), (*Microwave communication systems, Frequency multipliers), Transistor amplifiers, Varactor diodes, Power amplifiers, Transistors, Great Britain, Airborne.

One scheme under consideration for aircraft communication via a satellite envisages the use of a multi-element aerial array at L-band (1.54 GHz to 1.66 GHz) each element simultaneously transmitting 10 W. This paper describes an experimental system capable of feeding two aerials at 1.6 GHz. This is achieved by frequency multiplication and power amplification of an existing 400 MHz power source. Two frequency doubling stages are used in each arm of the system. A UHF power transistor is used in the varactor mode to produce power gain in addition to frequency doubling, and this is followed by a step-recovery varactor frequency-doubler producing 10 W at 1.6 GHz. (Author)
AD-713 292 HC$3.00 MF$0.65

A COMPARATIVE ASSESSMENT OF TWO FORMS OF CYCLOCONVERTER.
Technical rept.,
Royal Aircraft Establishment Farnborough (England)
A. Bainbridge. May 70, 47p Rept no. RAE-TR-70092 TRC-BR-20725

Descriptors: (*Frequency converters, Generators), Power supplies, Control systems, Mathematical analysis, Great Britain.
Identifiers: *Cycloconverters.

The operation of two forms of cycloconverter, using natural and forced commutation, is described and analysed mathematically, with particular reference to equivalent circuit parameters, effective power factor and harmonic content. It has been claimed that the differences between these alternatives will have significant effects on the performance and engineering arrangement of variable speed constant frequency (VSCF) aircraft generating systems, and the analysis confirms that forced commutation has theoretical advantages which could result in simplified circuitry and reduced size of alternator. The results presented, which admittedly apply to ideal situations, will help in the assessment of the two systems and indicate further avenues of research. (Author)
AD-713 294 HC$3.00 MF$0.65

A NOTE ON THE GENERALIZED LUNEBURG LENSES,
Michigan Univ Ann Arbor Radiation Lab
V. Daniele, P. L. E. Uslenghi, and R. Zich. 23 Feb 70, 10p Rept no. Scientific-9 AFCRL-70-0533
Contract F19628-68-C-0071
Availability: Pub. in Alta Frequenza, v39 n5 p400-404 1970.

Descriptors: (*Electromagnetic lenses, Refractive index), Microwaves, Boundary value problems, Mathematical analysis, Luneberg lens antennas.
Identifiers: *Luneburg lenses.

Spherically symmetric, inhomogeneous dielectric lenses which image two given concentric spheres onto one another are considered. Formulas and diagrams are obtained for the dependence of the refractive index on the radial distance from the center of the lens. Some exact solutions to the problem are also given. (Author)
AD-713 309

SMOOTHING, FILTERING, AND BOUNDARY EFFECTS,
Air Force Cambridge Research Labs L G Hanscom Field Mass
For primary bibliographic entry see Field 12A.
AD-713 331

MICROWAVE BREAKDOWN PREDICTIONS FOR A RECTANGULAR APERTURE ANTENNA,
Avco Systems Div Wilmington Mass
Ronald L. Fante, and Joseph T. Mayhan. 17 Jul 69, 5p AFCRL-70-0554
Contract F19628-69-C-0121
Revision of report dated 8 May 69.
Availability: Pub. in Jnl. of Applied Physics, v40 n12 p4750-4752 Nov 69.

Descriptors: (*Slot antennas, Electric discharges), Electromagnetic fields, Antenna apertures, Rectangular bodies, Theory, Predictions.
Identifiers: *Microwave breakdown.

The theory is presented for predicting the microwave breakdown characteristic of a rectangular aperture antenna, including realistic near electric fields. The theory is then compared with experimental data. (Author)
AD-713 366

THE NEAR FIELD OF THE LOOP ANTENNA,
Avco Systems Div Wilmington Mass
Ronald L. Fante, J. J. Otazo, and Joseph T. Mayhan. 24 Apr 69, 7p AFCRL-70-0555
Contract F19628-69-C-0121
Revision of report dated 31 Jan 69.
Availability: Pub. in Radio Science, v4 n8 p697-701 Aug 70.

Descriptors: (*Loop antennas, Electromagnetic fields), Electric fields, Electric discharges.
Identifiers: Microwave breakdown.

The near fields of a circular loop antenna were evaluated and discussed for various size loops. The results are obtained in a form that is useful in predicting the microwave breakdown characteristics of the antenna. (Author)
AD-713 368

EFFECT OF FINITE GROUND PLANE CONDUCTIVITY ON APERTURE ADMITTANCE,
Avco Systems Div Wilmington Mass
Ronald L. Fante. 10 Nov 69, 4p AFCRL-70-0552
Contract F19628-69-C-0121
Availability: Pub. in IEEE Transactions on Antennas and Propagation, vAP-18 n4 p565-566 Jul 70.

Descriptors: (*Antenna apertures, Admittance), Boundary value problems.

An upper bound on the error involved in approximating the actual admittance of an aperture in an imperfectly conducting ground plane by the admittance of the same aperture located in a perfectly conducting plane is obtained. (Author)
AD-713 382

OPTIMUM DISTRIBUTION OVER A CIRCULAR APERTURE FOR BEST MEAN-SQUARE APPROXIMATION TO A GIVEN RADIATION PATTERN,
Avco Systems Div Wilmington Mass
Ronald L. Fante. 12 Jun 69, 7p AFCRL-70-0553
Contract F19628-69-C-0121
Revision of report dated 28 Feb 69.
Availability: Pub. in IEEE Transactions on Antennas and Propagation, vAP-18 n2 p177-181 Mar 70.

Descriptors: (*Antenna apertures, Numerical analysis), Synthesis, Functions, Rings.

The distribution over a circular aperture in a ground plane that produces the best mean-square approximation to a specified radiation pattern is derived subject to constraints on the mean-square aperture field strength. The result is derived in terms of the functions most natural for a least square fit: the eigenfunctions of a finite (circular) two-dimensional Fourier transform. (Author)
AD-713 383

A PARAMETRON MIXER (O Parametrone Smeshannoqo Tipa),
Army Foreign Science and Technology Center Washington D C
V. M. Yurkevich. 11 May 70, 13p Rept no. FSTC-HT-23-154-70
Trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Radioelektronika (USSR) v6 n3 p267-274 1968 (sic).

Descriptors: (*Oscillators, Phase-locked systems), Tuned circuits, Varactor diodes, Capacitance, USSR.

Identifiers: Translations, *Parametrons.

The results are given for theoretical analysis and experimental verification of a parametron having two modulated parameters, which utilizes varactors as non-linear capacitances. (Author)
AD-713 467 HC$3.00 MF$0.65

STUDY OF FREQUENCY-SCANNING ARRAY OF RADIATORS ON CONVEX CURVE,
Army Foreign Science and Technology Center Washington D C
R. A. Granovskaya. 1 Sep 70, 15p Rept no. FSTC-HT-23-268-70
Trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Radioelektronika (USSR) v11 n5 p452-459 1968.

Descriptors: (*Antenna arrays, Mathematical analysis), Slot antennas, Antenna radiation patterns, Waveguides, USSR.
Identifiers: Translations.

Problems of realizing a convex slotted-guide array of radiators with frequency scanning are examined. Results of calculations of the required parameters of the radiator array are set forth for a number of specific cases along with experimental results of a study of a convex array of radiators designed on the basis of calculation results. (Author)
AD-713 471 HC$3.00 MF$0.65

SEMI-CONDUCTOR INTEGRATED CIRCUIT COMPONENT MODELS.
Cullen Coll of Engineering Houston Tex
For primary bibliographic entry see Field 9A.
AD-713 475 HC$3.00 MF$0.65

DIELECTRIC FIELD COMPUTATIONS IN SEMICONDUCTOR OXIDE INTEGRATED CIRCUITS.
Technical rept.,
Cullen Coll of Engineering Houston Tex
Don L. Cannon. Jul 70, 82p Rept no. THEMIS-RE-3-70
Contract N00014-68-A-0151
Report on Information Processing Systems.

Descriptors: (*Integrated circuits, Potential theory), (*Semiconductor devices, Voltage), Partial differential equations, Boundary value problems, Numerical analysis, Integration, Computer programs, Temperature, Thermal stability, Theses.
Identifiers: Themis project, Harmonic functions, Elliptic differential equations.

The report deals with the application of the point relaxation method for the numerical solution of Laplace's or Poisson's equations in multi-dielectric regions in semiconductor integrated circuits. In particular, the type of geometry considered in this report is a rectangular or square region whose boundary potentials may or may not be specified, with a dielectric interface parallel to one of the boundaries. This type of problem is very difficult to solve analytically and yet it is an important problem in planar integrated circuit analysis. The structure is essentially the same as the oxide over silicon or as the junction regions in such a device. Often the electrical field or the static temperature distribution of such regions are required and the research described in this report provides a technique for determining such information. (Author)
AD-713 476 HC$3.00 MF$0.65

WIDE-BAND HOT-CARRIER DIODE GATE WITH APPLICATION TO ELECTRON-HOLE PLASMAS,
Boeing Scientific Research Labs Seattle Wash
R. M. Lantz, W. P. Robbins, H. J. Fossum, and B. Ancker-Johnson. Sep 70, 19p Rept no. D1-82-0996

Descriptors: (*Gates (Circuits), Design), (*Semiconductors, Plasma medium), Indium antimonides, Diodes (Semiconductor), Pulse generators, Synchronization (Electronics), Carriers (Semiconductors).
Identifiers: Hot carriers, Semiconductor plasmas.

A sampling or tone-burst gating system using hot-carrier diodes has been designed and shown to have the following characteristics: band width, dc to 1GHz; rise and fall times, typically = or < 3nsec and 5nsec; power capacility, about 100mW; gating pulse frquency, 10Hz to 1MHz; gating pulse width, 50nsec to 5msec; leakage, >45db down at 100kHz and about 24 db down at 500MHz; gate isolation from common ground reference, >60db at all frequencies; input and output impedances, adjustable to match source and load. As this gating system consists of two identical gates in parallel, it presents a constant impedance to prevent undesirable loading perturbations of the rf source. The gate can be synchronized with an rf signal whose frequency is = or < 1GHz and with the described design changes, may be synchronized with about 10GHz signal. (Author)
AD-713 602 HC$3.00 MF$0.65

METHOD OF LAYING OUT PRINTED CIRCUITS,
Foreign Technology Div Wright-Patterson AFB Ohio
G. E. Shiro, and L. I. Lapidus. 27 Aug 70, 22p Rept no. FTD-MT-24-109-70
Edited machine trans. of mono. Primenenie Vychislitelnykh Mashin dlya Analiza Ustoichivosti i Tokov Korotkogo Zamykaniya v Energosistemakh (The Application of Computers in the Analysis of Stability and Short Circuit Currents in Power Systems), Kiev, 1968 p199-215, by K. L. Dion.

Descriptors: (*Printed circuits, Design), Configuration, Optimization, USSR.
Identifiers: Translations, Computer aided design.

A method of laying out printing combinations, making it possible to achieve a high density of printed conductors for highly complex circuits is proposed. The method considers electrical, structural and technological requirements on the printed wiring. (Author)
AD-713 615 HC$3.00 MF$0.65

DIE ANTENNENANLAGEN DER ZENTRALEN DEUTSCHEN BODENSTATION (ZDBS) FUER SATELLITENFUNK (Antenna Installations of the Central German Ground Station for Satellite Communications),
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Oberpfaffenhofen (West Germany)
Herwig Oettl. 1 Dec 69, 5p Rept no. DFVLR-Sonderdruck-52
Text in German.
Availability: Pub. in Nachrichtentechnische Zeitschrift, n3 p165-167 1970. No copies furnished.

Descriptors: (*Antennas, *Space communication systems), Radio relay systems, West Germany.
AD-713 640

BULLETIN OF THE RADIO AND ELECTRICAL ENGINEERING DIVISION OF THE NATIONAL RESEARCH COUNCIL OF CANADA. VOLUME 20, NUMBER 2, APRIL-JUNE 1970.
National Research Council of Canada Ottawa (Ontario) Radio and Electrical Engineering Div
For primary bibliographic entry see Field 9C.
AD-713 683

ADMITTANCE, ISOLATION, AND RADIATION PATTERNS OF RECTANGULAR SLOT ANTENNAS IN THE PRESENCE OF A SIMULATED REENTRY SHEATH.
Research rept. Jul 69-Jun 70,
Aerospace Corp El Segundo Calif Lab Operations
Gordon E. Stewart, and Kurt E. Golden. 1 Jul 70, 34p Rept no. TR-0059 (6220-10)-2 SAMSO-TR-70-308
Contract F04701-70-C-0059

Descriptors: (*Slot antennas, Plasma sheath), Admittance, Attenuation, Antenna radiation patterns, Atmosphere entry, Rectangular bodies.

The admittance, isolation, and element radiation patterns of reduced-height rectangular slot antennas in a plasma-clad ground plane were measured and compared with theoretical predictions. The plasma sheath simulates the electromagnetic properties of a high-altitude boundary layer and is produced by pulsed electron beam emission from the ground plane in the presence of a low-pressure gas. (Author)
AD-713 702 HC$3.00 MF$0.65

A TUTORIAL EXPOSITION OF THE FUNDAMENTAL NETWORK-THEORETIC IDEAS UNDERLYING MODERN INSERTION-LOSS FILTER DESIGN.
Technical rept.,
Polytechnic Inst of Brooklyn N Y Dept of Electrophysics
Dante C. Youla. Sep 70, 120p Rept no. PIBEP-70-056 RADC-TR-70-182
Contract F30602-69-C-0053

Descriptors: (*Electrical networks, Design), (*Electric filters, Design), Matrix algebra, Low-pass filters, Gain, Differential equations, Complex variables, Integration, Transformations (Mathematics), Optimization.
Identifiers: *Network synthesis, Frequency response.

From the outset research in Network theory has been propelled forward by the desire to build superior filters incorporating the many practical constraints in a realistic way. The early emergence of the image-parameter method of filter design was quite natural since in concept it was based squarely on a modal picture, so familiar in classical physics. However, despite its uncontested intuitive appeal the image-parameter philosophy has two rather pronounced rawbacks. First, the description of a lumped 2-port in terms of irrational functions such as image impedances, propagation constants, etcetera, instead of polynomials, is perhaps unnatural from the point of view of good pedagogy. Second, the terminations demanded by the theory are the image impedances of the filter and not the resistors which must actually be employed in practice. A great deal of effort (and ingenuity) is required to evaluate and equalize this mismatch effect, especially for wide-band designs. Nevertheless, it is fair to say that when the technique is applicable it works well and quickly and the treatise by Cauer must be considered definitive. (Author)
AD-713 720 HC$3.00 MF$0.65

GAS-TUBE ISOLATOR CIRCUIT FOR PHASED ARRAYS,
Army Electronics Command Fort Monmouth N J Electronic Components Lab
Sol Schneider. 22 Dec 69, 2p
Availability: Pub. in IEEE Transactions on Aerospace and Electronic Systems, vAES-6, n4 p593-594 Jul 70.

Descriptors: (*Phased arrays, *Switching circuits), Radiofrequency, Attenuators.

An arcing amplifier in a large amplifier array operating from a common power supply and energy storage bank must be isolated from the rest of the system to permit continuous operation of the system. A gas-tube isolator circuit is proposed wherein the tube is programmed to charge the individual secondary capacitance bank of each amplifier during the interpulse interval. Since the gas tube is nonconducting during the pulsing period of the amplifier, it isolates the amplifier from the rest of the system in case of a fault. (Author)
AD-713 735

REDUCTION OF MIXER INTERMODULATION BY NEUTRAL RF BIASING,
Army Electronics Command Fort Monmouth N J Electronic Warfare Lab
Eli F. Beane. 23 Jan 70, 1p
Availability: Pub. in IEEE Transactions on Electromagnetic Compatibility, vEMC12 n2 p64 May 70.

Descriptors: (*Crystal mixers, Modulation), Radiofrequency, Reduction.
Identifiers: *Intermodulation.

The introduction of a neutral RF signal to a nonlinear resistance diode mixer as a means of reducing the effects of undesired intermodulation is described. (Author)
AD-713 744

PHASE CORRECTION ON A SMALL REFLECTOR IN A DOUBLE REFLECTOR ANTENNA (Vozmozhnosti Fazovoy Korrektsii na Malom Zelkale v Dvukhzerkalnoi Antenne),
Army Foreign Science and Technology Center Washington D C
A. L. Aizenberg. 1 Sep 70, 17p Rept no. FSTC-HT-23-251-70
Trans. of Antenny (USSR) n2 p166-178 1967.

Descriptors: (*Antennas, *Phase control devices), Reflectors, Corrections, Parabolic antennas, Deformation, USSR.
Identifiers: Translations.

The effect of the redistribution of energy in a double reflector system on the directive gain and noise temperature of an antenna with compensation of phase errors caused by deflections of the main (large) reflector by automatic correction of the shape of the auxiliary (small) reflector, is analyzed in approximations of geometrical optics. The maximum tolerable deformations of the reflectors for given deteriorations of the antenna characteristics can be determined on the basis of the results of the calculations. (Auhor)
AD-713 761 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: MAINTENANCE OF CLOTHING AND EQUIPMENT.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 15E.
AD-713 790 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: VISUAL, SOUND, AND TACTUAL COMMUNICATION.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 15G.
AD-713 799 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: AIRMOBILE OPERATIONS.
Human Resources Research Organization Alexandria Va
For primary bibliographic entry see Field 15G.
AD-713 807 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: SQUAD FORMATIONS, BATTLE DRILL, AND ELEMENTARY FIRE AND MANEUVER.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 15G.
AD-713 822 HC$3.00 MF$0.65

DESIGNERS MANUAL FOR CIRCUIT DESIGN BY ANALOG/DIGITAL TECHNIQUES FINAL REPORT.
Tulane Univ., New Orleans, La. Systems Lab.
C. H. Beck, and M. H. Kuo. Jul 70, 85p NASA-CR-113113
Contract NAS12-2059

Descriptors: *Computerized design, *Hybrid computers, *Integrated circuits, Analog computers, Computer programming, Digital techniques, Mathematical models.

For abstract, see STAR 08 21.
N70-37785 HC$3.00 MF$0.65

THEORETICAL ANALYSIS OF DIPOLE ANTENNA CHARACTERISTICS ON THE RAE SATELLITE, PART 1 FINAL REPORT.
Technology for Communications International, Mountain View, Calif.
Aug 70, 226p NASA-CR-113112, TCI-2236-PT-1
Contract NAS5-11256

Descriptors: *Antenna radiation patterns, *Computer programs, *Current distribution, *Dipole antennas, *Radio astronomy explorer satellite, Damping, Libration, Orthogonality, Preamplifiers, Printouts.

For abstract, see STAR 08 21.
N70-37959 HC$3.00 MF$0.65

RESEARCH AND DEVELOPMENT OF A UHF CORRELATOR.
Etude Et Realisation D'un Correlateur Uhf
National Aeronautics and Space Administration, Washington, D. C.
B. Pando. Sep 70, 82p NASA-TT-F-13232, EUR-CEA-FC-547
Tran- Transl. Into English of French Report Eurcea-fc-547 P 1-82

Descriptors: *Correlators, *Research and development, *Ultrahigh frequencies, Analog data, Autocorrelation, Circuit diagrams, Information theory, Mathematical models, Oscilloscopes, Systems engineering.

For abstract, see STAR 08 21.
N70-38314 HC$3.00 MF$0.65

THEORETICAL ANALYSIS OF DIPOLE ANTENNA CHARACTERISTICS ON THE RAE SATELLITE, PART 2 DRAFT FINAL REPORT.
Technology for Communications International, Mountain View, Calif.
Jul 70, 251p NASA-CR-112966, TCI-2236
Contract NAS5-11256

Descriptors: *Antenna radiation patterns, *Current distribution, *Dipole antennas, *Radio astronomy explorer satellite, Radio frequencies, Satellite antennas, Tables (data).

For abstract, see STAR 08 21.
N70-38848 HC$3.00 MF$0.65

AN ANALYSIS OF THIN-WIRE CIRCULAR LOOP ANTENNAS OF ARBITRARY SIZE,
Sandia Labs., Albuquerque, N. Mex.
L. D. Licking, and D. E. Merewether. Aug 70, 75p

Descriptors: (*Loop antennas, Wire), Far field, Electric fields, Electric current, Numerical analysis.

For abstract, see NSA 24 20.
SC-RR-70-433 HC$3.00 MF$0.65

COMPUTER AIDED DESIGN OF MICROWAVE TRIODE OSCILLATORS,
Sandia Labs., Albuquerque, N. Mex.
R. J. Chaffin. Jul 70, 42p

Descriptors: (*Microwave oscillators, Triodes), Electron tubes, Microwave tubes, Feedback circuits, Design.
Identifiers: *Computer aided design.

For abstract, see NSA 24 20.
SC-RR-70-497 HC$3.00 MF$0.65

9F. Telemetry

A SHORT-RANGE DIGITAL TELEMETRY SYSTEM FOR REMOTE POSITIONING REGULATOR CONTROLLERS,
Foreign Technology Div Wright-Patterson AFB Ohio
V. A. Skiba, I. N. Evtushenko, Yu. V. Pelikh, and I. P. Chervonii. 9 Sep 70, 12p Rept no. FTD-MT-24-159-70
Edited machine trans. of Mekhanizatsiya i Avtomatizatsiya Upravleniya (USSR) n4 p59-62 1968, by W. W. Kennedy.

Descriptors: (*Telemeter systems, Digital computers), (*Production control, Automation), Servomechanisms, Synchros, Remote control systems, Sound signals, Distribution functions, USSR.
Identifiers: Translations, *Automatic control, Process control, Regulators.

A remote system of multipoint process control is described, in which communication between the command center and its controlled stations is done via telemetry. Either existing telephone lines in the plant or added TM lines may be used. Control points are queried sequentially in binary code as to the correctness of their position, or are commanded to new set points on the basis of central computer calculations. The coded words used are the following: station address, task, proof of correctness, and verifications 'message received' and 'correction made', and a break-off command. The method applies to electric or hydraulic motor controllers with voltage feedback to the summing point. An operating system described uses type RD-09 two-phase asynchronous control motors with 120-ohm potentiometer feedback. The system error is claimed not to exceed 1.5 percent. (Author)
AD-713 616 HC$3.00 MF$0.65

10. ENERGY CONVERSION (NON-PROPULSIVE)

10B. Power Sources

SHIPBOARD AND STATIONARY LIQUID-METAL POWER PLANTS,
Naval Intelligence Command Alexandria Va Translation Div
A. A. Kanaev, and I. Z. Kopp. 10 Sep 70, 131p Rept no. NIC-Trans-3113
Trans. of mono. Sudovie i Statsionarnye Zhidkometallicheskie Energeticheskie Ustanovki, Leningrad, 1967 p29-142, 224-240.

Descriptors: (*Electric power production, *Liquid metals), Mercury, Alkali metal alloys, Nuclear power plants, Nuclear powered vessels, Ships (Nonmilitary), Liquid metal coolants, Breeder reactors, Energy conversion, Liquid metal pumps, Eutectics, Heat exchangers, Magnetohydrodynamic generators, Thermoelectricity, Fuel cells, Instrumentation, USSR.
Identifiers: Translations, *Liquid metal power plants.

Contents: Thermal systems and basic equipment for liquid-metal power plants; Liquid metals in plants for the direct conversion of heat and chemical energy of fuel into electrical energy; Pumps, heat exchangers, and auxiliary equipment for liquid-metal plants; and Instrumentation for liquid-metal power plants.
AD-713 282 HC$3.00 MF$0.65

EXPERIMENTAL SUPERCONDUCTING ALTERNATORS WITH IRON-CORE AND IRON-FREE ARMATURES,
Army Mobility Equipment Research and Development Center Fort Belvoir Va
James H. Ferrick, and Carl J. Heise. 1970, 12p

Descriptors: (*Generators, *Superconductivity), Cryogenics, Armatures, Coils, Iron, Copper, Performance (Engineering).
Identifiers: AC generators.

Iron-core and iron-free alternators employing super-conducting field windings have been designed and constructed. The design equations have been verified experimentally. The machines have been performance tested and their terminal characteristics obtained. Results indicate a need to carefully consider eddy current losses in copper conductors for designs in which the windings are exposed to peak magnetic flux changes. The advantages of using ferromagnetic materials in designs in which saturation flux densities are not encountered are illustrated. (Author)
AD-713 523 HC$3.00 MF$0.65

OPEN CYCLE HYDROCARBON-AIR FUEL CELL POWER PLANT,
Army Mobility Equipment Research and Development Center Fort Belvoir Va
Edward A. Gillis, O. Fred Kezer, Jr., and Walter G. Taschek. 1970, 15p

Descriptors: (*Fuel cells, Design), (*Hydrocarbons, Fuel cells), Electrolytes, Phosphoric acids, Catalysts, Communication equipment.
Identifiers: *Hydrocarbon air fuel cells, Hydrogen air fuel cells.

Discussed are various types of fuel cells suitable for front line warfare communication systems. Mentioned is the hydrocarbon-air fuel cell and various electrolytes including phosphoric acid.
AD-713 528 HC$3.00 MF$0.65

FIELD TEST OF A STEAM CONDENSER HEAT SINK CONCEPT,
Cold Regions Research and Engineering Lab Hanover N H
For primary bibliographic entry see Field 13M.
AD-713 572 HC$3.00 MF$0.65

FLYING WEIGHT OF AN AIRCRAFT GENERATOR (Polethyi ves Samoletnogo Generatora),
Army Foreign Science and Technology Center Washington D C
D. I. Zaslavskii. 3 Jun 70, 11p Rept no. FSTC-HT-23-437-70
Trans. of Elektrotekhnika (USSR) v39 n4 p4-6 1968.

Descriptors: (*Generators, Weight), Liquid cooled, Gas turbines, Turbojet engines, Fuel consumption, Air cooled, Mathematical analysis, USSR.
Identifiers: Translations.

Expressions for calculating the flight weight of an aircraft generator using various cooling systems and with different generator drives have been formulated. The methods of calculating flight weight are cited in this article.
AD-713 762 HC$3.00 MF$0.65

QUARTERLY STATUS REPORT ON 238Pu SPACE ELECTRIC POWER FUEL DEVELOPMENT PROGRAM, JANUARY 1-MARCH 31, 1970.
Los Alamos Scientific Lab., N. Mex.
For primary bibliographic entry see Field 18N.
For abstract, see NSA 24 20.
LA-4476 HC$3.00 MF$0.65

BIFOLD NUCLEAR POWER SOURCE,
Mound Lab., Miamisburg, Ohio.
For primary bibliographic entry see Field 18N.
For abstract, see NSA 24 20.
MLM-1357 HC$3.00 MF$0.65

ADVANCED HEAT PIPE THERMIONIC TECHNOLOGY. TOPICAL REPORT, TASK II. DEVELOPMENT OF ADSORPTION RESERVOIR.
Period of performance 1 Mar 69-30 Sep 69,
Radio Corp. of America, Lancaster, Pa.
R. A. Freggens. 1970, 48p
Contract AT (30-1)-3979

Descriptors: (*Thermionic converters, Design), (*Thermionic heat pipes, Design), Cesium, Thermionic emitters.
Identifiers: *Heat pipes.

For abstract, see NSA 24 20.
NYO-3979-4 HC$3.00 MF$0.65

FLIGHT DATA ANALYSIS OF POWER SUBSYSTEM DEGRADATION AT NEAR SYNCHRONOUS ALTITUDE FINAL REPORT.
Philco-ford Corp., Palo Alto, Calif. Western Development Lab. Div.
W. T. Picciano, and R. A. Reitman. 15 Jul 70, 363p
NASA-CR-112952, WDL-TR4223
Contract NASW-1876

Descriptors: *Postflight analysis, *Radiation damage, *Solar cells, *Spacecraft power supplies, Solar activity effects, Trapped particles.

For abstract, see STAR 08 21.
N70-38190 HC$3.00 MF$0.65

BATTELLE INFORMATION NUMBER 1.
Battelle Inst., Frankfurt Am Main (West Germany).
For primary bibliographic entry see Field 20E.
For abstract, see STAR 08 21.
N70-38876 HC$3.00 MF$0.65

ECONOMIC COMPARISON OF SINGLE-PURPOSE AND DUAL-PURPOSE NUCLEAR PLANTS FOR SUPPLYING WIDELY SEPARATED POWER AND WATER LOADS,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 18E.
For abstract, see NSA 24 20.
ORNL-TM-2899 HC$3.00 MF$0.65

10C. Energy Storage

ANALYSIS AND EVALUATION OF SPACECRAFT BATTERY ACCELERATED LIFE TEST DATA.
Naval Ammunition Depot Crane Ind Quality Evaluation Dept
22 Sep 70, 81p Rept no. QE/C-70-687

Descriptors: (*Storage batteries, Accelerated testing), (*Alkaline cells, Accelerated testing), Statistical analysis, Failure (Electronics), Nickel, Cadmium, Reliability (Electronics), Life expectancy.
Identifiers: *Nickel cadmium batteries, *Spacecraft batteries.

The report presents the findings from the mathematical/statistical analysis of data generated from the accelerated life test on 40 nickel-cadmium spacecraft battery cells. Two major objectives of the analysis were to: (1) determine the applicability and reliability of the previously developed cell life prediction model when applied to an accelerated life situation and (2) attempt to make alterations in the prediction model which would make it more conducive to accelerated life testing. Results of the analysis, based on eight failures to date, indicate: (1) about 75% accuracy in predicting the useful life of a cell with the original prediction model and (2) the application of Bayesian analysis techniques yields the same accuracy, but enables the model to be formally used in the absence of historical data. (Author)
AD-713 457 HC$3.00 MF$0.65

EVALUATION PROGRAM FOR SECONDARY SPACECRAFT CELLS - SYNCHRONOUS ORBIT TESTING OF GENERAL ELECTRIC COMPANY 6.0 AMPERE-HOUR NICKEL-CADMIUM CELLS.
Naval Ammunition Depot, Crane, Ind. Quality Evaluation Dept.
D. E. Christy, and D. G. Miley. 14 Aug 70, 41p
NASA-CR-113115, QE/C-70-634
NASA ORDER W-12397

Descriptors: *Nickel cadmium batteries, *Space environment simulation, *Synchronous satellites, Coulometers, Electric potential, Graphs (charts), Spacecraft orbits, Spacecraft power supplies, Temperature effects.

For abstract, see STAR 08 21.
N70-37987 HC$3.00 MF$0.65

EVALUATION PROGRAM FOR SECONDARY SPACECRAFT CELLS - ACCEPTANCE TESTS OF GULTON INDUSTRIES 6.0 AMPERE-HOUR NICKEL-CADMIUM CELLS WITH GULTON PLATES.
Naval Ammunition Depot, Crane, Ind. Quality Evaluation Dept.
D. E. Christy, and D. G. Miley. 14 Aug 70, 18p
NASA-CR-113116, QE/C-70-662
NASA ORDER W-12397

Descriptors: *Acceptability, *Nickel cadmium batteries, *Spacecraft power supplies, Leakage, Performance tests, Tables (data).

For abstract, see STAR 08 21.
N70-38040 HC$3.00 MF$0.65

TESTING OF SILVER CADMIUM CELLS FINAL REPORT.
General Electric Co., Philadelphia, Pa. Missiles and Space Div.
M. D. Read. 1 May 70, 47p NASA-CR-72719, GE-SSO-70SD249
Contract NAS3-13223

Descriptors: *Fatigue life, *Silver cadmium batteries, *Thermal cycling tests, Ambient temperature, Inorganic materials, Separators.

For abstract, see STAR 08 21.
N70-38614 HC$3.00 MF$0.65

11. MATERIALS

11A. Adhesives and Seals

EFFECT OF OIL FILMS ON THE ADHESION OF POLYMERS TO METAL,
Foreign Technology Div Wright-Patterson AFB Ohio
G. D. Mirzoev, and Sh. Z. Zakirov. 20 Aug 70, 6p
Rept no. FTD-HT-23-445-70
Edited trans. of Tadzhikskii Selskokhozyaistvennyi Institut, Dushanbe. Trudy (USSR) v13 p73-76 1968, by L. Thompson.

Descriptors: (*Metals, *Bonding), (*Polyamide plastics, Bonding), Steel, Lubricants, Surfaces, Films, USSR.
Identifiers: *Dissimular materials bonding, *Plastic bonding, Surface finishing, Translations.

Steel cylinders were coated with 0.05-0.1 mm layers of machine oil, diesel oil, motor oil, automobile lubricant, or glycerol. The cylinders were heated at 310 degrees for 20-100 min. cooled and coated with a film of polycaprolactam (I). The adhesive strength (A) between I and the cylinder was

at a maximum, i.e. 375 kg/sq cm when the cylinders were coated with machine oil and heated during 40 min. the control samples, which were carefully degreased before the application of I, and A equals 50 kg/sq cm. The increase of A is due to the polymn. of the oil on the steel surface during heating. The obtained polymer had better A to I than steel. Motor oils, which contain antioxidants and detergents, do not polymerize readily and thus do not increase A appreciably. (Author)
AD-713 450 HC$3.00 MF$0.65

PROPERTIES OF n-BUTYL-alpha-CYANOACRYLATE RESTORATIVE MATERIALS,
Walter Reed Army Medical Center Washington D C Army Inst of Dental Research
Simon Civjan. 1970, 13p*

Descriptors: (*Acrylic resins, *Adhesives), (*Dentistry, Adhesives), Polymerization, Reinforced plastics, Elasticity, Oxides, Reinforcing materials, Friedel-Crafts reactions, Carbonates.
Identifiers: *Acrylic acid/ (butyl-ester)-cyano, *Polyacrylates, *Tissue adhesives, *Filled thermoplastics, *Particulate composites.

The alkyl-alpha-cyanoacrylates have recently gained increased attention in both medical and dental professions. In dentistry, these monomers have been investigated for use as liners, pit and fissure sealants, and more recently as luting agents, hemostatic dressings and temporary tissue adhesives. While earlier work has been limited to the rapidly degradable and more toxic methyl ester, recent studies have been expanded to include the more biostable higher homologs. Of these, the n-butyl-alpha-cyanoacryplate has gained the widest attention. The purpose of the study has been to assess the usefulness of butyl cyanoacryplate in restorative dentistry. For this purpose, polymerization characteristics and physical properties of the unfilled and variously filled resin were investigated. (Author)
AD-713 516 HC$3.00 MF$0.65

REFLECTION CRACK SEALING STUDY.
Final research rept.,
Louisiana Dept. of Highways. Research and Development Section.
Edward J. Breckwoldt. Jun 69, 51p RR-38

Descriptors: (*Bituminous concrete, *Sealers), (*Flexible pavements, Sealers), Cracks, Sealing, Field tests, Cold weather tests, Waterproofing, Concrete pavements.

The report deals with the effectiveness of 'Reclamite' when used as a sealant and compare it with the material now in use (catonic emulsfied asphalt-RS-3K). The evaluation was limited to reflection cracks developed in HMAC pavements placed on PCC pavements or Portland Cement stabilized bases. The results indicated that neither sealant was satisfactory for use and that further studies should be made to evaluate other materials. This study noted that at two specific locations, the joints were 78% sealed with foreign matter. It was recommended that observations continue on these untreated sections to determine the effects of not sealing and if sealing is even necessary or desirable. (Author)
PB-195 180 HC$3.00 MF$0.65

11B. Ceramics, Refractories, and Glasses

DETERMINATION OF THE ATTENUATION OF OPTICAL GLASS FIBRES,
Signals Research and Development Establishment Christchurch (England)
For primary bibliographic entry see Field 20F.
AD-713 262 HC$3.00 MF$0.65

SPINODAL DECOMPOSITION,
Northwestern Univ Evanston Ill Dept of Materials Science
For primary bibliographic entry see Field 7D.
AD-713 310

ORIENTED EUTECTIC MICROSTRUCTURES IN THE SYSTEM Al2O3/ZrO2,
Army Materials and Mechanics Research Center Watertown Mass
Frederick Schmid, and Dennis J. Viechnicki. 2 Mar 70, 8p Rept no. AMMRC-TR-70-27
Revision of report dated 6 Oct 69.
Availability: Pub. in Jnl. of Materials Science, v5 p470-473 1970.

Descriptors: (*Alumina, *Microstructure), (*Zirconium oxides, Microstructure), Phase studies, Crystal growth.
Identifiers: Orientation, Eutectics.

Oriented eutectic microstructures have been produced in the system Al2O3/ZrO2 using a Bridgman-type crystal-growing furnace. Ingots consisted of elongated columnar grains or colonies. Inside the colonies a rod-type eutectic microstructure consisting of rods of ZrO2 surrounded by an Al2O3 matrix was observed. The eutectic point was re-established at 63 mol% Al2O3/37.0 mol% ZrO2 and 1870C. Al203 is the first phase to nucleate when eutectic growth occurs. (Authors)
AD-713 336

INVESTIGATION OF THE SYSTEMS P2O5-Sb2O3-Cr2O3 AND P2O5-Sb2O3-V2O5,
Foreign Technology Div Wright-Patterson AFB Ohio
V. K. Dombrovskaya, Z. A. Konstant, T. N. Miller, and A. Ya Vaivad. 10 Aug 70, 8p Rept no. FTD-HT-23-372-70
Edited trans. of mono. Neorganicheskie Steklovidnye Pokrytiya i Materialy (Inorganic Vitreous Coatings and Materials), Riga, 1969 p101-106, by D. Koolbeck.

Descriptors: (*Phosphate glass, *Phase studies), Melting, Differential thermal analysis, X-ray diffraction analysis, Electrical properties, Antimony compounds, Chromium compounds, Vanadium compounds, Oxides, USSR.
Identifiers: Translations.

A study was made of glass formation in the systems phosphorus pentoxide-antimony trioxide-chromic oxide and phosphorus pentoxide-antimony trioxide-vanadium pentoxide by means of differential thermal analysis with simultaneous recording of the change in electrical conductivity and X-ray analysis of the firing products. Certain physicochemical and electrical properties of glasses in the phosphorus pentoxide-antimony trioxide-chromic oxide system were investigated. The possibility of using complex thermal and qualitative X-ray analysis for studying melting processes and the characteristics of glass and crystalline-glass materials was demonstrated. (Author)
AD-713 449 HC$3.00 MF$0.65

ADSORPTION-SENSITIVE MECHANICAL AND MACHINING BEHAVIOUR OF SODA-LIME GLASS.
Technical rept. no. 1,
Martin Marietta Corp Baltimore Md Research Inst for Advanced Studies
A. R. C. Westwood, G. H. Parr, Jr., and R. M. Latanision. Sep 70, 23p*
Contract N00014-70-C-0330

Descriptors: (*Glass, *Drilling), (*Crack propagation, Glass), (*Cutting fluids, Glass), Surface properties, Machining, Water, Toluenes, Alkanes, Alcohols, Hardness, Adsorption.
Identifiers: *Alkali glass.

A study was made of the influence of water, toluene, the n-alkanes and the n-alcohols on the pendulum hardness, fracture, and drilling (machining) behaviour of a soda-lime glass. The energy, theta, required to propagate cracks was determined by a double-cantilever technique. Drilling experiments revealed, however, that despite the lower value of theta for glass in water, this environment is not an effective cutting medium, and that the higher alcohols and alkanes are superior by factors of up to twenty times. Of particular interest is the observation that the effectiveness of the latter environments varies non-linearly with molecular chain length, being a maximum in heptyl alcohol and heptane, respectively. It was also noted that by mixing two alcohols or alkanes of different chain length, it is possible to reproduce the drilling characteristics of alcohols or alkanes of intermediate chain length in the homologous series. The results of this work reveal that the environment-sensitive machining behaviour of glass in essentially non-aqueous environments is not determined by the water content of the environment, or by any influence of the environment on the ease with which cracks may be propagated, or by the dielectric constant, dipole moment, viscosity, or any other obvious environmental parameter. The possibility that such behaviour could arise as a consequence of a stress-plus-chemisorption-induced redistribution of sodium ions is discussed. (Author)
AD-713 594 HC$3.00 MF$0.65

ENVIRONMENT-SENSITIVE MACHINING BEHAVIOR OF NONMETALS.
Technical rept. no. 2,
Martin Marietta Corp Baltimore Md Research Inst for Advanced Studies
A. R. C. Westwood, and R. M. Latanision. Oct 70, 56p* Rept no. RIAS-TR-70-10c
Contract N00014-70-C-0330

Descriptors: (*Glass, *Drilling), (*Ceramic materials, *Machining), (*Cutting fluids, Ceramic materials), Adsorption, Surface properties, Impurities, Cracks, Mechanical properties, Magnesium oxides.
Identifiers: *Rebinder effects, *Alkali glass.

Liquid environments can influence the efficiency of machining nonmetallic solids in a variety of ways, e.g., by serving as lubricants, coolants, or particle dispersants. Because of its technological potential, the characteristics and possible mechanisms of this latter phenomenon -- the Rebinder effect -- receive primary consideration in this paper. For crystalline ceramics, Rebinder effects in machining arise because of the influence of the environment on near-surface dislocation behavior. Effects resulting from adsorption-induced changes in the surface free energy of the solid are of minor importance. Rebinder effects can also occur in non-crystalline solids, however, and recent observations on such effects in various glasses are described. The possibility that these effects are caused by a stress-plus-chemisorption-induced redistribution of sodium ions in the near-surface region is discussed. The importance of considering the total cutting system, environment - solid - tool, in any account of environment-sensitive machining is stressed, for environments which facilitate material removal when one type of tool is used can be detrimental to the effectiveness of another tool with a different cutting action. (Author)
AD-713 595 HC$3.00 MF$0.65

PHASE EQUILIBRIA INVESTIGATION OF BINARY, TERNARY, AND HIGHER ORDER SYSTEMS. PART IX. CALCULATION OF THERMODYNAMIC QUANTITIES FROM PHASE DIAGRAMS.
Aerojet-General Corp Sacramento Calif Materials Research Lab
For primary bibliographic entry see Field 7D.
AD-713 712 HC$3.00 MF$0.65

THEORY OF CARBON FORMATION IN VAPOR-PHASE PYROLYSIS. VOLUME I. CONSTANT CONCENTRATION OF ACTIVE SPECIES.
Rept. for Jun 66-Jan 67,
Aerospace Corp., El Segundo, Calif. Labs. Div.
J. L. Hudson, and Julian Heicklen. Apr 67, 48p
TR-1001 (2250-40)-13-Vol-1 SSD-TR-67-73
Contract AF 04 (695)-1001
See also Volume 2, AD-699 564. Distribution Limitation now Removed.

Descriptors: (*Carbon, *Vapor plating), Pyrolytic graphite, Pyrolysis, Particle size, Mathematical analysis.
Identifiers: *Chemical vapor deposition, Vapor deposition.

The paper gives a theoretical discussion of carbon formation from the pyrolytic decomposition of gaseous carbon compound in an isothermal flow reactor of cylindrical shape and radius R (0). It is assumed that pyrolysis of the gas gives an active species (designated C) that can add to carbon particles and that the carbon particles with n > or = to 2 can grow in the gas phase or deposit on the wall. There is no limit on the size particle that can be formed. The case is considered in which C is constant in both the axial and radial directions, but Cn can vary. The assumption of axial constancy corresponds to the case of uniform deposition along the tube. Experimental results indicate that deposition rates of about 10 to the 6th can be realized, but at the sacrifice of uniformity of deposition. Thus, experiment and theory are in satisfactory agreement. (Author)
AD-815 672 HC$3.00 MF$0.65

STUDY OF STRUCTURAL BEHAVIOR OF THIN FILMS SECOND YEAR SUMMARY REPORT, 17 SEP. 1968 - 17 SEP. 1969.
Norton Research Corp., Cambridge, Mass.
E. E. Chadsey, Jr., and F. Feakes. Sep 69, 90p
NASA-CR-112946
Contract NASW-1802

Descriptors: *Boron, *Boron carbides, *Mechanical properties, *Thin films, *Vacuum deposition, Adhesion, Cracking (fracturing), High temperature, Tensile strength.

For abstract, see STAR 08 21.
N70-38158 HC$3.00 MF$0.65

THERMAL CONDUCTIVITY OF A PARTICULATE SAMPLE IN AN ENVIRONMENT THAT SIMULATES THE PLANET MARS.
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
J. A. Fountain, and R. W. Scott. 16 Sep 69, 20p
NASA-TM-X-53919, MSFC-IN-SSL-T-68-15

Descriptors: *Environment simulation, *Glass, *Particles, *Thermal conductivity, Heat measurement, Mars environment.

For abstract, see STAR 08 21.
N70-38164 HC$3.00 MF$0.65

IMPACT CAPABILITY OF SAFETY GLAZING MATERIALS.
Southwest Research Inst., San Antonio, Tex.
For primary bibliographic entry see Field 13F.
PB-195 040 HC$3.00 MF$0.65

11C. Coating, Colorants, and Finishes

SEAMANSHIP MANUAL,
Naval Intelligence Command Alexandria Va Translation Div
For primary bibliographic entry see Field 13J.
AD-713 272 HC$3.00 MF$0.65

EVALUATION OF MASONRY COATINGS.
Research rept.,
Louisiana Dept. of Highways. Research and Development Section.
Hollis B. Rushing. Aug 69, 25p RR-42

Descriptors: (*Concrete finishing, *Coatings), (*Grout, Concrete finishing), Grout, Composite materials, Polymers, Elastomers, Field tests, Abrasion tests, Concrete durability.

The report describes the evaluation of five coating systems to replace the conventional Class 2 rubbed finish now required on concrete structures. The evaluation consisted of preparing test specimens with each of the five coatings and conducting absorption, freeze and thaw durability, abrasion and accelerated weathering test and comparing the results to test specimens having a Class 2 rubbed finish. The conclusions reached from this study were that four of the five systems would be acceptable as a replacement for Class 2 rub. The only system that did not perform satisfactorily exhibited excessive scaling during the freeze and thaw tests. (Author)
PB-195 179 HC$3.00 MF$0.65

11D. Composite Materials

STIFFNESS AND EXPANSION ESTIMATES FOR ORIENTED AND RANDOM FIBROUS COMPOSITES.
Technical rept. Apr-Sep 69,
Air Force Materials Lab Wright-Patterson AFB Ohio
J. C. Halpin, and N. J. Pagano. Aug 70, 22p* Rept no. AFML-TR-69-341

Descriptors: (*Composite materials, Mechanical properties), Fibers, Deformation, Glass textiles, Alignment.
Identifiers: *Fiber composites, Stiffness, Expansion, Fiberglass reinforced composites, *Oriented fiber composites, *Random fiber composites.

There are many technological applications for materials composed of short oriented or randomly arranged fibers interconnected by a bonding substance. A random arrangement of fibers in space can be treated analytically as a laminated solid. In this approximation the homogeneous material is considered to be mathematically equivalent to a material composed of layers corresponds to the volume fraction of fibers of the particular orientation in the material being modeled. The success of the lamination approximation is strongly dependent upon the assumption of physical volume averaging in real materials combined with an ability to estimate the stiffness and expansion properties for an oriented short-fiber ply. Approximate procedures for estimation of ply properties are advanced, using the Halpin-Tsai equations and Schapery's analysis. Substantial agreement is achieved between the experiment for both the oriented and random problems. (Author)
AD-713 099 HC$3.00 MF$0.65

HIGH-TEMPERATURE STRUCTURAL RESINS.
Final rept. 8 Jun 67-8 May 68,
Whittaker Corp San Diego Calif Narmco Research and Development Div
Paul M. Hergenrother, and Harold M. Levine. Jun 68, 79p Rept no. NRD-MJO-325-a
Contract N60921-67-C-0221
See also Final rept. dated 17 Jul 66, AD-642 043.

Descriptors: (*Reinforced plastics, Synthesis (Chemistry)), (*Laminated plastics, Heat-resistant plastics), (*Heat-resistant plastics, Synthesis (Chemistry)), Composite materials, Thermal stability, Glass textiles, N-heterocyclic compounds, Adhesives, Porosity, Filament wound construction, Boron, Graphite, Drawing (Machine processing), Tensile properties, S-heterocyclic compounds.
Identifiers: *Polyquinoxalines, *Fiberglass reinforced plastics, *Poly (biquinoxalinediyl-phenylene-oxy-phenylene), *Poly ((biquinoxalinediyl/diphenyl)-phenylene), *Poly ((biquinoxalinediyl/diphenyl)-phenylene-oxy-phenylene), *Poly (bis (benzothiazolediyl)-phenylene).

Polyquinoxalines were shown to have outstanding processability which enables fabrication of laminates having resin matrices with reduced porosity. Excellent laminate and adhesive data were obtained after 200 hours at 600F or 50 hours at 700F, both in air and tested at temperature. Initial efforts provided encouraging results on unidirectional composites, using high modulus fibers. Some polymer modification is necessary to remove slight thermoplasticity. Polyphenylquinoxalines are definitely more stable than polyquinoxalines, when tested under isothermal conditions and demonstrate excellent processability. A sharp increase in glass transition temperature is necessary to exploit this improved stability. Two polyquinoxalines were tested for compatibility with ONT and HNS II heat resistant explosives at 260C. Both samples were found to be very compatible. Samples of both polyquinoxalines were submitted for tests as a potential fiber. Both could be formed into fibers having interesting high temperature properties; the half ether has somewhat better. Polybenzothiazoles continued to provide problems in monomer purity. (Author)
AD-713 180 HC$3.00 MF$0.65

FIBRE-FILLED THERMOPLASTICS: PART 1. ASBESTOS.
Technical rept.,
Explosives Research and Development Establishment Waltham Abbey (England)
B. E. Brokenbrow, B. L. Hollingsworth, K. J. Ledbury, and D. Sims. Dec 69, 35p* Rept no. ERDE-TR-2 TRC-BR-19356

Descriptors: (*Reinforced plastics, Thermoplastics), (*Asbestos, *Reinforcing materials), Fibers, Silicates, Tensile properties, Manufacturing methods, Test methods, Great Britain.
Identifiers: *Asbestos reinforced composites, *Fiber composites, Serpentine, Amphiboles.

A range of graded and ungraded chrysotile and amosite asbestos fibres were examined as reinforcing fillers for thermoplastics. Methods of incorporating the fibre were examined and the effects of incorporation and processing on the fibre length has been studied. The tensile properties of the asbestos fibre reinforced materials were measured and compared with the properties of glass reinforced materials. (Author)
AD-713 274 HC$3.00 MF$0.65

EFFECT OF OIL FILMS ON THE ADHESION OF POLYMERS TO METAL,
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 11A.
AD-713 450 HC$3.00 MF$0.65

PROPERTIES OF n-BUTYL-alpha-CYANOACRYLATE RESTORATIVE MATERIALS,
Walter Reed Army Medical Center Washington D C Army Inst of Dental Research
For primary bibliographic entry see Field 11A.
AD-713 516 HC$3.00 MF$0.65

HOLOGRAPHIC INSPECTION OF LAMINATE BONDS,
Army Weapons Command Rock Island Ill
For primary bibliographic entry see Field 14B.
AD-713 545 HC$3.00 MF$0.65

RUBBER TOUGHENED ACRYLIC POLYMERS FOR ARMOR APPLICATIONS,
Army Materials and Mechanics Research Center Watertown Mass
For primary bibliographic entry see Field 19D.
AD-713 558 HC$3.00 MF$0.65

CRYOGENIC MATERIALS DATA HANDBOOK (REVISED). VOLUME II. SECTIONS D, E, F, G, H AND I.
Martin Marietta Corp Denver Colo Denver Div
For primary bibliographic entry see Field 11F.
AD-713 620 HC$10.00 MF$0.65

FINITE ELEMENT ANALYSIS OF BENDING-EXTENSIONAL COUPLING IN LAMINATED COMPOSITES,
Virginia Polytechnic Inst Blacksburg Dept of Civil Engineering
C. W. Pryor, Jr., and R. M. Barker. 9 Jul 70, 4p
Contract DAAF07-69-C-0444
Availability: Pub. in Jnl. of Composite Materials, v4 p549-552 Oct 70.

Descriptors: (*Laminates, Bending), (*Laminated plastics, Bending), Carbon fibers, Deflection, Mechanical properties.
Identifiers: Graphite composites.

The designer of asymmetric laminates which are subjected primarily to transverse loads is interested in the effects of bending-extensional coupling on the overall response of the composite. Because of the many variables to consider, a variety of parametric investigations are necessary to ascertain the effects of coupling. For example, the reduction of effective laminate stiffness due to coupling may depend on the modular ratio (E (11)/E (12)) and orientation of the individual as well as on the type of loading and support conditions. The purpose of the paper is to present numerical results of a finite element analysis and to present additional results which will further define the effects of coupling on gross laminate behavior. Although the results presented herein are only for the elastostatic deformation behavior, the finite element analysis can conveniently be extended for the solution of a larger class of problems and a complete description of the coupling phenomena can be obtained. (Author)
AD-713 645

ANALYTICAL PROCEDURES FOR PREDICTING THE MECHANICAL PROPERTIES OF FIBER REINFORCED COMPOSITES.
Summary rept. 1 Jul 69-31 Mar 70,
Wisconsin Univ Madison
Millard W. Johnson, Jr. 1 Jul 70, 27p AFML-TR-65-220-Pt-5
Contract F33615-69-C-1735
See also AFML-TR-65-220-Pt-4, AD-686 457.

Descriptors: (*Composite materials, Mechanical properties), (*Reinforcing materials, Mechanical properties), Fibers, Mathematical analysis, Deformation, Stresses, Strain (Mechanics), Tensile properties, Modulus of elasticity.
Identifiers: *Fiber composites.

An integral equation formulation of the equations of linear elasticity is used to examine the interfacial stress and displacement components for a single fiber in an infinite array of fibers. The composite is under uniaxial tension. A theory for calculating composite elastic moduli is also developed. The fibers are of finite length with results restricted to aspect ratio 1. (Author)
AD-713 675 HC$3.00 MF$0.65

WAVE PROPAGATION IN LAMINATED COMPOSITES,
Northwestern Univ Evanston Ill
For primary bibliographic entry see Field 20K.
AD-713 745

FIBER-REINFORCED METAL-MATRIX COMPOSITES: GOVERNMENT-SPONSORED RESEARCH, 1964-1966,
Battelle Memorial Inst., Columbus, Ohio. Defense Metals Information Center.
Curtis M. Jackson, and H. J. Wagner. 1 Sep 67, 66p DMIC-241
Contract AF 33 (615)-3408
Distribution Limitation now Removed.

Descriptors: (*Composite materials, *Reviews), (*Reinforcing materials, *Fibers), Wire, Filaments, Whiskers (Crystals), Particles, Aluminum, Magnesium, Titanium, Cobalt, Copper, Iron, Lead, Tin, Nickel, Silver, Tantalum, Tungsten, Alloys, Alumina.
Identifiers: *Metal matrix composites, *Fiber composites.

The introductory sections contain a brief discussion of the general methods of producing fiber-reinforced composites and of the theory of fiber-reinforcement of metals. The body of the report describes research on fiber-reinforced metal matrix composites, and is organized according to metal matrix materials. For convenience, the report is divided into two sections: Low density matrices (including aluminum, magnesium, and titanium and their alloys) and high density matrices (cobalt, copper and its alloys, iron, lead-tin alloys, nickel and nickel alloys, silver, tantalum, and tungsten). (Author)
AD-824 631 HC$3.00 MF$0.65

PRELIMINARY COST ESTIMATE FOR THE RADIATION-INDUCED PLASTIC IMPREGNATION OF CONCRETE,
Brookhaven National Lab., Upton, N.Y.
For primary bibliographic entry see Field 13C.
For abstract, see NSA 24 20.
BNL-11263 HC$3.00 MF$0.65

11E. Fibers and Textiles

THEORY AND PRACTICE OF THE PRODUCTION OF FIBER MATERIALS,
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 11F.
AD-713 668 HC$3.00 MF$0.65

BIBLIOGRAPHIES ON FABRIC FLAMMABILITY. PART 5. TESTING AND TEST METHODS.
National Bureau of Standards, Washington, D.C. Inst. for Applied Technology.
For primary bibliographic entry see Field 13L.
PB-195 028 HC$0.45 MF$0.65

11F. Metallurgy and Metallography

FRACTURE MECHANICS FOR DESIGN AND FAILURE ANALYSIS.
Syracuse Univ N Y Metallurgical Research Labs
For primary bibliographic entry see Field 20L.
AD-713 148 HC$3.00 MF$0.65

EXPERIMENTAL PHASE EQUILIBRIA OF SELECTED BINARY, TERNARY, AND HIGHER ORDER SYSTEMS. PART VII. THE PHASE DIAGRAM Ti-V-C.
Technical rept. Apr 67-May 69,
Aerojet-General Corp Sacramento Calif Materials Research Lab
Edwin Rudy. Aug 70, 75p AFML-TR-69-117-Pt-7
Contract F33615-67-C-1513
See also Part 6, AD-700 985 and Part 8, AD-708 476.

Descriptors: (*Vanadium alloys, Phase studies), (*Titanium alloys, Phase studies), Carbon alloys, Phase diagrams, Carbides, Solid solutions, Melting point, Differential thermal analysis, Microstructure.

The phase relationships in the Ti-V-C system were experimentally investigated by means of X-ray, melting point, DTA, and metallographic methods on heat-treated and melted specimens, and a phase from 1400C through the melting range established. The solid state equilibria are characterized by the monocarbide phases, and a limited Ti-exchange in V2C (15 At. % at 1400C); a wide two-phase equilibrium is formed between the carbon-deficient monocarbide solid solution and the metal phase. The V2C-solid solution is terminated by a three-phase equilibrium, V2C + (V,Ti)C1-x + (V,Ti)-ss, in the ternary. Four isothermal reactions occur in the system, of which three correspond to pseudobinary eutectic reactions, and the fourth to a ternary eutectic between metal, subcarbide, and monocarbide. The monocarbide solid solution has a minimum melting point of 2625C at a composition Ti-V-C (6-50-44 At.%). (Author)
AD-713 150 HC$3.00 MF$0.65

PHASE EQUILIBRIA INVESTIGATION OF BINARY, TERNARY, AND HIGHER ORDER SYSTEMS. PART I. THE PHASE DIAGRAMS OF THE SYSTEMS Ti-Nb-C, Ti-Ta-C, AND Ti-Mo-C.
Technical rept.,
Aerojet-General Corp Sacramento Calif Materials Research Lab
E. Rudy. Aug 70, 148p AFML-TR-69-117-Pt-1
Contract F33615-67-C-1513
See also Part 2 dated Aug 69, AD-695 063.

Descriptors: (*Titanium alloys, Phase studies), Niobium alloys, Carbon alloys, Phase diagrams, Melting point, Differential thermal analysis, Microstructure, Carbides.

The ternary alloy systems Ti-Nb-C, Ti-Ta-C, and Ti-Mo-C were investigated by means of X-ray, melting point, DTA, and metallographic techniques and phase diagrams for all three systems from 1500C through the melting range were established. The solid state phase relationships in all three systems are similar. The cubic monocarbides are completely miscible, whereas the subcarbides, Nb (Ta,Mo)C2 show limited solubility and are terminated by three-phase equilibria Me + Me2C + MeC1-x in the ternary. The sublattice order-disorder transition in the subcarbides are lowered by titanium substitutions. The monocarbide solutions in all three systems show a regular melting behavior. The phase relationships of the three systems are discussed and the differences in particular equilibria related to the thermodynamic properties of the phases in the boundary systems. (Author)
AD-713 153 HC$3.00 MF$0.65

EXPERIMENTAL PHASE EQUILIBRIA OF SELECTED BINARY, TERNARY, AND HIGHER ORDER SYSTEMS. PART V. THE PHASE DIAGRAM W-B-C.
Technical rept. Apr 67-May 69,
Aerojet-General Corp Sacramento Calif Materials Research Lab
E. Rudy. Aug 70, 62p AFML-TR-69-117-Pt-5
Contract F33615-67-C-1513
See also Part 4, AD-695 062.

Descriptors: (*Tungsten alloys, Phase studies), Boron alloys, Carbon alloys, Phase diagrams, Carbides, Melting point, Differential thermal analysis, Microstructure.

The ternary alloy system W-B-C was investigated experimentally by means of X-ray, melting point, DTA, and metallographic techniques on hot pressed and heat treated, as well as melted specimens, and a phase diagram from 1500C through the melting range established. No ternary phases are formed in the system and the mutual solubilities between carbide and boride phases are small. The solid state sections (<2000C) are characterized by two-phase equilibria existing between the phase pairs W2B + W2C, W2B + WC, WC + WB, WB + C, W2B5 + C, W2B5 + B4C, and WB approximately 4 + B4C. The two-phase equilibrium W2B + WC is replaced by an equilibrium W2C + WB above 2150C. Fifteen ternary isothermal reactions were found. Five are associated with pseudobinary eutectic equilibria, six with ternary eutectics, and the remaining four with class II ternary four-phase reaction isotherms. (Author)
AD-713 154 HC$3.00 MF$0.65

TOTAL MATERIAL VARIABLES INFLUENCING A DUCTILE-BRITTLE TRANSITION TEMPERATURE FOR MOLYBDENUM.
Technical rept.,
Maryland Univ College Park Engineering Materials Group
E. Pink, and R. W. Armstrong. Sep 70, 22p Rept no. TR-1
Contract N00014-67-A-0239-0011

Descriptors: (*Molybdenum, Ductile brittle transition), Transition temperature, Grain size, Grain structures (Metallurgy).

The ductile-brittle transition temperature for a coarse grained re-crystallized molybdenum material was found to be lower than for the original fine grained metal from which it was produced. The coarse grain size resulted from a critical straining and subsequent annealing treatment at a low recrystallization temperature. It is concluded from an analysis of various strength parameters which are either measured or estimated for this material that an improved grain boundary strength and a considerable influence of the dislocation substructure are responsible for the less brittle behavior of the coarse grained molybdenum. (Author)
AD-713 191 HC$3.00 MF$0.65

SPINODAL DECOMPOSITION,
Northwestern Univ Evanston Ill Dept of Materials Science
For primary bibliographic entry see Field 7D.
AD-713 310

THE EFFECT OF LOADING RATE AND TEMPERATURE ON THE FRACTURE TOUGHNESS OF HIGH STRENGTH STEELS.
Technical rept.,
Watervliet Arsenal N Y
David P. Kendall. Jul 70, 32p Rept no. WVT-7044

Descriptors: (*Steel, Fracture (Mechanics)), Loading (Mechanics), Strain (Mechanics), Low-temperature research.
Identifiers: *High strength steels.

The effect of loading rates, ranging from 10 to 100,000 ksi square root of (in/sec), and temperatures, ranging from room temperature to -100F, on the plane strain fracture toughness of several high strength alloy steels has been determined. Materials investigated are a commercial 4340 steel, a modified 4330 steel from a gun tube forging having three different heat treatments and two different heats of 250 grade maraging steel. Test specimens utilized are essentially ASTM 'compact tension' type specimens of one inch thickness. Tests were conducted on an open loop, hydraulic, high loading rate tensile testing machine. Results are presented in the form of graphs of fracture toughness versus temperature for the maximum and minimum loading rates ('dynamic' and 'static'). Fracture toughness versus loading rate at -60F and yield strength versus elastic strain rate at room temperature, -60F and -100F for one heat of maraging steel are also reported. (Author)
AD-713 357 HC$3.00 MF$0.65

THE AS-QUENCHED FORM OF THE OMEGA PHASE IN Zr-Nb ALLOYS.
Technical rept.,
Cornell Univ Ithaca N Y Dept of Materials Science and Engineering
C. W. Dawson, and S. L. Sass. 5 Dec 69, 12p Rept no. TR-1
Contract N00014-67-A-0077-0012
Also Available as Rept. no. MSC-1267.
Availability: Pub. in Metallurgical Transactions, v1 p2225-2233 Aug 70.

Descriptors: (*Zirconium alloys, Phase studies), Niobium alloys, Electron diffraction analysis, Electron microscopy, Crystal structure.

The as-quenched omega phase was examined in the Zr-Nb system using high resolution dark field electron microscopy and selected area diffraction. (Author)
AD-713 384

THE EFFECT OF NUCLEAR IRRADIATION ON THE PROPERTIES OF ORDERED SOFT MAGNETIC ALLOYS,
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 18H.
AD-713 447 HC$3.00 MF$0.65

THERMODYNAMICS OF THE CORROSION INHIBITION OF IRON IN THE Fe/H2O, H2O2, O2 SYSTEM,
Foreign Technology Div Wright-Patterson AFB Ohio
Z. Pavlovich, and T. Markovich. 13 Aug 70, 7p
Rept no. FTD-HT-23-346-70
Edited trans. of Mezhdunarodnogo Kongressa Korrozii Metallov (3rd) 1966. Trudy (International Congress on the Corrosion of Metals (3rd) 1966. Transactions), n.p., 1968 v2 p106-110, by V. Mesenzeff.

Descriptors: (*Iron, *Corrosion inhibition), (*Electrochemistry, *Iron), Thermodynamics, Solutions, Oxygen, Peroxides, USSR.
Identifiers: Translations.

The thermodynamic criterion Pi of the course of the electrode reactions in the water, hydrogen peroxide, and iron/water, oxygen systems were detd.; Pi equals a given formula, where A is the chem. affinity and U the polarization in the presence of adsorbed H and the c and a subscripts refer to the cathodic and anodic reactions, resp.; Pi is given in volt times kcal. The Pi - pH diagrams for these systems were obtained. The products of Fe corrosion that are most likely is given. The developed method of thermodynamic calcns. allows for discriminating between the inhibitive actions of oxygen and hydrogen peroxide.
AD-713 451 HC$3.00 MF$0.65

ANISOTROPY OF FATIGUE CRACK PROPAGATION IN HOT ROLLED BANDED STEEL PLATE,
Watervliet Arsenal N Y
Francis A. Heiser. 1970, 15p

Descriptors: (*Steel, Crack propagation), Metal plates, Anisotropy, Fatigue (Mechanics), Stresses.

The dependence of crack growth rate on stress intensity factor was found to be sensitive to the microstructural constituents, their orientation with respect to the fracture plane and direction, and the level of the stress intensity factor. The anisotropy of crack growth rate was found to be a function of the level of the stress intensity factor. Macroscopi growth rate could be considered to be the summation of several fracture mechanisms, the most important being striation formation and local fracture of brittle microconstituents, viz., inclusion-matrix fracture or cleavage. Striation spacing was seen to be independent of orientation suggesting that fracture of inclusions was responsible for the crack growth rate anisotropy. This indicated that steel cleanliness should be more important in low cycle fatigue applications. The dependence of crack growth rate on stress intensity factor decreased as the toughness of the base material increased. In general, those factors which contributed to high fracture energy also contributed to low fatigue crack growth rate, particularly at the higher values of K. (Author)
AD-713 536 HC$3.00 MF$0.65

THE USE OF MARTENSITE MATERIALS IN THE DESIGN OF THERMALLY ACTIVATED SPRINGS,
Frankford Arsenal Philadelphia Pa Pitman-Dunn Research Labs
Frederick Rothwarf, Arthur Auerbach, and Donald Ford. 1969, 15p

Descriptors: (*Martensite, Thermal properties), (*Springs, *Arming devices), Helical springs, Heat treatment, Thermal diffusion, Thermal conductivity, Heat of activation, Fuzes (Ordnance), Aerodynamic heating, Nickel alloys, Titanium alloys.
Identifiers: Martensite transformations, Cantilever springs, Materials with memory, Nitinol (Alloys).

The report presents a thermal analysis of heat activated metallic springs that could be utilized as fuze arming devices.
AD-713 578 HC$3.00 MF$0.65

CRYOGENIC MATERIALS DATA HANDBOOK (REVISED). VOLUME I. SECTIONS A, B, C.
Technical documentary rept.,
Martin Marietta Corp Denver Colo Denver Div
Fred R. Schwartzberg, Samuel H. Osgood, Carol Bryant, and Marvin Knight. Jul 70, 757p* AFML-TDR-64-280-Vol-1-Rev
Contracts AF 33 (657)-9161, F33615-67-C-1794
Revision of report dated Aug 64, AD-609 562 and Supplement 4 dated Aug 68, AD-679 087. See also Volume 2, Revised, AD-713 620.

Descriptors: (*Cryogenics, *Handbooks), (*Aluminum alloys, Cryogenics), (*Stainless steel, Cryogenics), (*Titanium alloys, Cryogenics), Mechanical properties.

The report contains information on the cryogenic mechanical properties of aluminum alloys, stainless steel, and titanium alloys.
AD-713 619 HC$10.00 MF$0.65

CRYOGENIC MATERIALS DATA HANDBOOK (REVISED). VOLUME II. SECTIONS D, E, F, G, H AND I.
Technical documentary rept.,
Martin Marietta Corp Denver Colo Denver Div
Fred H. Schwartzberg, Samuel H. Osgood, Carol Bryant, and Marvin Knight. Jul 70, 552p* AFML-TDR-64-280-Vol-2-Rev
Contracts AF 33 (657)-9161, F33615-67-C-1794
Revision of report dated Aug 64, AD-609 562 and Supplement 4 dated Aug 68, AD-679 087. See also Volume 1, Revised, AD-713 619.

Descriptors: (*Cryogenics, *Handbooks), (*Nickel alloys, Cryogenics), (*Steel, Cryogenics), (*Polymers, Cryogenics), (*Reinforced plastics, Cryogenics), (*Seals, Cryogenics), (*Copper alloys, Cryogenics), Gaskets, Mechanical properties, Nylon, Epoxy plastics, Polyester plastics, Composite materials, Test methods.
Identifiers: Inconel, *Tetrafluoroethylene resins, *Fiberglass reinforced plastics, *Polychlorotrifluoro ethylene.

The report contains information on the cryogenic mechanical properties of superalloys, steel, miscellaneous metals and alloys, polymers, fiber reinforced plastics, and seals and gaskets.
AD-713 620 HC$10.00 MF$0.65

THEORY AND PRACTICE OF THE PRODUCTION OF FIBER MATERIALS,
Foreign Technology Div Wright-Patterson AFB Ohio
I. M. Kopev, and M. K. Rybalchenko. 9 Sep 70, 9p
Rept no. FTD-HT-23-530-70
Edited trans. of mono. Poroshkovaya Metallurgiya v Novoi Tekhnike. Sbornik (Powder Metallurgy in New Technology. Collection), Moscow 1968 p5-13, by D. Koolbeck.

Descriptors: (*Fiber metallurgy, Manufacturing methods), Whiskers (Crystals), USSR, Reviews.
Identifiers: *Metal fibers, Translations.

The authors explain the main stages in the development of fiber metallurgy abroad, describe

a method of producing fiber materials, and discuss the principles of developing composite materials based on metal fibers with specific physical properties. Data on materials based on filamentary crystals (whiskers) are presented and a brief review of Soviet experimental work in the field of fiber metallurgy is given. The applications of fiber materials are discussed. (Author)
AD-713 668 HC$3.00 MF$0.65

GRAIN REFINEMENT IN UNDERCOOLED COPPER,
Defence Standards Labs Maribyrnong (Australia)
B. L. Jones, and G. M. Weston. 22 May 70, 4p
Availability: Pub. in The Jnl. of the Australian Institute of Metals, v15 n3 p167-170 Aug 70. No copies furnished.

Descriptors: (*Copper, Grain structures (Metallurgy)), Cooling, Recrystallization, Australia.
Identifiers: *Grain refinement, Undercooling.

It was shown possible to obtain a fine equiaxed grain structure throughout a copper ingot containing 0.015 wt % oxygen if prior to nucleation the ingot is undercooled by 55 deg C. After undercoolings of 38 deg C or less the ingots had structures consisting of two separate zones of fine and coarse grains, and the proportion of fine grains decreased with increasing temperature of nucleation. The fine grain structure is attributed to a dendrite remelting process which arises during recalescence in the presence of approximately 150 ppm oxygen. In contrast to earlier experiments involving copper of higher oxygen content and nucleated at larger undercoolings, little evidence of recrystallization was found in these present ingots. It is therefore suggested that recrystallization in high oxygen ingots is connected with the large amount of undercooling applied rather than with the presence of oxygen. (Author)
AD-713 737

MARTENSITIC TRANSFORMATION IN A SPLAT COOLED Au-50 At% Cd ALLOY.
Technical rept.,
Polytechnic Inc of Brooklyn N Y Dept of Physical and Engineering Metallurgy
Paul Ferraglio, K. Mukherjee, and L. S. Castleman. 18 Mar 70, 7p Rept no. TR-2
Contract N00014-67-A-0438-0002
Availability: Pub. in Acta Metallurgica, v18 p1067-1070 Oct 70.

Descriptors: (*Gold alloys, Phase studies), (*Cadmium alloys, Phase studies), Cooling.
Identifiers: Phase transformations, Splat cooling.

Martensitic transformations were studied in splat cooled samples of an Au-50 at.% Cd alloy. A vertical shock-tube apparatus was used to quench the molten alloy from various controlled temperatures in the liquid state to room temperature, the quenching rate being of the order of 10 to the 7th power C/sec. The splat cooled samples were studied by the use of X-ray and electron diffraction as well as transmission electron microscopy. It was found that quenching, even at this high speed, from temperatures as high as 300C above the melting point of this alloy did not affect its long range order. Furthermore, the martensitic transformation temperature was suppressed in the splat cooled samples, and the high temperature beta-phase CsCl type structure persisted. This metastable structure was then found to decompose isothermally at room temperature into three morphologically and crystallographically different martensitic phases. Excellent resolution of the martensitic fine structure was obtained by this splat cooling technique. (Author)
AD-713 747

PECULIARITIES OF PRODUCING THERMALLY STRENGTHENED TITANIUM ALLOYS (Osobennosit Proizvodstva Termicheski Uprochnyaemykh Titanovykh Splavov),
Army Foreign Science and Technology Center Washington D C
I. I. Kaganovich, E. D. Igumenshchev, and V. I. Khorokhorina. 22 Sep 70, 17p Rept no. FSTC-HT-23-243-70
Trans. of mono. Lightweight Alloys and Their Treatment Methods, Moscow, 1968, p268-277.

Descriptors: (*Titanium alloys, Heat treatment), Grain structures (Metallurgy), Microstructure, Production, Sheets, Mechanical working, USSR.
Identifiers: Translations.

The heterogeneity of the structure of heat strengthened alloys increases their structural sensitivity. The usage of charge materials with the minimum quantity of alpha stabilizing impurities, improved conditions of vacuum arc melting of ingots under increased vacuum with lower leakage, the usage of heat and mechanical deformation regimes providing the required structure allow products to be produced from these alloys with high and stable mechanical properties. (Author)
AD-713 760 HC$3.00 MF$0.65

CHARACTERIZATION OF CORROSION LAYERS ON ALUMINUM BY SHIFTS IN THE ALUMINUM AND OXYGEN X-RAY EMISSION BANDS,
Technical rept.,
Pennsylvania State Univ University Park Materials Research Lab
P. D. Gigl, G. A. Savanick, and E. W. White. 29 Sep 69, 7p Rept no. TR-5
Contract N00014-67-A-0385-0002
Revision of report dated 8 May 69.
Availability: Pub. in Jnl. of the Electrochemical Society, v117 n1 p15-17 Jan 70.

Descriptors: (*Aluminum, *Corrosion), (*X-ray spectroscopy, Aluminum), Alumina, Films, Chemical bonds.

An x-ray emission technique is outlined for the characterization of thin layers of aluminum oxides, aluminum oxyhydroxides, and aluminum hydroxides on aluminum. Shifts in the Al K beta and O K alpha x-ray emission lines of standard compounds are presented and are then used to characterize thin corrosion layers on aluminum. (Author)
AD-713 766

INTERACTION OF HAFNIUM WITH CERTAIN TRANSITION METALS,
Foreign Technology Div Wright-Patterson AFB Ohio
V. N. Svechnikov, A. K. Shurin, G. P. Dmitrieva, and R. A. Alfintseva. 11 Aug 70, 8p Rept no. FTD-HT-23-401-70
Edited trans. of mono. Diagrammy Sostoyaniya Metallicheskikh Sistem; Obzor Issledovanii (Diagrams of the Composition of Metallic Systems; Coverage of Studies), Moscow, 1968 p153-156, by V. Mesenzeff.

Descriptors: (*Heat-resistant metals + alloys, Hafnium alloys), (*Phase diagrams, *Hfnium alloys), Phase studies, Iron alloys, Manganese alloys, Nickel alloys, Cobalt alloys, USSR.
Identifiers: Translations.

Despite its high cost, hafnium has been gaining wider acceptance in modern technologies. Owing to its refractory properties combined with high solubility and its positive effect on heat resistance, hafnium has been used as a component of a number of new construction materials containing niobium, tantalum, molybdenum and tungsten. The paper analyzes the effect of hafnium on the properties of widely used alloys containing iron, nickel, copper, aluminum and presents phase diagrams of hafnium with manganese, iron, cobalt and nickel over the entire range of concentrations. (Author)
AD-713 778 HC$3.00 MF$0.65

THE METALLURGY OF PLUTONIUM,
National Science Foundation, Washington, D.C. Special Currency Science Information Program.
A. N. Volskii, and Ya M. Sterlin. 1970, 284p
SFCSI-AEC (TT-70-50004), TT-70-50004
Trans. of mono. Metallurgiya Plutoniya, Moscow, 1967 247p, by Ch. Nisenbaum.

Descriptors: (*Plutonium, Metallurgy), Plutonium alloys, Plutonium compounds, Nuclear fuels, Extraction, Refining, Nuclear fuel reprocessing, Handling, Safety.
Identifiers: Translations.
AEC-tr-7095 HC$3.00 MF$0.65

RADIATION CORROSION,
National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.
For primary bibliographic entry see Field 7E.
AEC-tr-7096 HC$3.00 MF$0.65

LARGE RADIOISOTOPE HEAT SOURCE CAPSULE PROGRAM. TOPICAL REPORT NO. 10. CREEP OF T-111 RADIOISOTOPE CONTAINMENT VESSELS UNDER INCREASING PRESSURE,
Atomics International, Canoga Park, Calif.
P. B. Ferry. 3 Jul 70, 114p
Contract AT (29-2)-2338

Descriptors: (*Tantalum alloys, Creep properties), (*Radioisotope heat sources, Containers), Nuclear auxillary power units, Hafnium containing alloys, Tungsten containing alloys.
Identifiers: Tantalum alloy T-111.

For abstract, see NSA 24 20.
AI-AEC-12943 HC$3.00 MF$0.65

LARGE RADIOISOTOPE HEAT SOURCE CAPSULE PROGRAM. TOPICAL REPORT NO. 12. TRANSIT CAPSULE PROCESS METALLURGY,
Atomics International, Canoga Park, Calif.
For primary bibliographic entry see Field 18N.
For abstract, see NSA 24 20.
AI-AEC-12967 HC$3.00 MF$0.65

SODIUM TECHNOLOGY QUARTERLY REPORT, JANUARY-MARCH 1970,
Argonne National Lab., Ill.
M. Ader, and G. Kesser. Jul 70, 95p
Contract W-31-109-eng-38

Descriptors: (*Sodium, *Nuclear reactor engineering), Chemical analysis, Monitors, Compatibility, Purification.

For abstract, see NSA 24 20.
ANL/ST-2 HC$3.00 MF$0.65

EMBRITTLING CHARACTERISTICS OF PRESSURE VESSEL STEEL PLATE,
Division of Technical Information Extension (AEC), Oak Ridge, Tenn.
Nobukazu Ogura. 1970, 5p
Trans. of Japan Atomic Energy Society Meeting, Paper Tokyo, 12-13 Feb 70 n.d., n.p.

Descriptors: (*Steels, *Embrittlement), Metal plates, Pressure vessels, Translations, Japan.

For abstract, see NSA 24 20.
CONF-700211-3 HC$3.00 MF$0.65

CORROSION OF ADVANCED STEAM GENERATOR ALLOY WELDMENTS IN 1100 AND 1200 F (595 AND 650 C) STEAM,
Southern Nuclear Engineering, Inc., Dunedin, Fla.
Joseph P. Hammond, P. Patriarca, G. M. Slaughter, and W. A. Maxwell. 1968, 15p
Presented at the Annual National Association of Corrosion Engineers (26th), Philadelphia, Pa. Mar 70.

Descriptors: (*Corrosion, *Weldments), (*Nickel chromium steels, Corrosion), (*Nickel chromium alloys, Corrosion), Boilers, Steels, Chromium containing alloys, Molybdenum containing alloys.

For abstract, see NSA 24 20.
CONF-700324-1 HC$3.00 MF$0.65

SUPERPLASTIC DEFORMATION IN A EUTECTIC ALLOY OF CADMIUM AND ZINC.
Doctoral thesis,
Illinois Univ., Urbana.
Edmund Alan Merriman. Feb 70, 110p
Contract AT (11-1)-1198

Descriptors: (*Zinc alloys, Plastic deformation), Cadmium containing alloys, Eutectics, Theses.
Identifiers: *Superplasticity.

For abstract, see NSA 24 20.
COO-1198-683 HC$3.00 MF$0.65

LOW TEMPERATURE ANNEALING OF ELECTRON IRRADIATED GERMANIUM.
Doctoral thesis,
Illinois Univ., Urbana.
William D. Hyatt. Jun 70, 91p
Contract AT (11-1)-1198

Descriptors: (*Germanium, *Annealing), Semiconductors (Materials), Electron irradiation, Defects, Radiation damage, Theses.

For abstract, see NSA 24 20.
COO-1198-735 HC$3.00 MF$0.65

A STUDY OF THE MECHANISM OF STRESS CORROSION CRACKING IN THE IRON-NICKEL-CHROMIUM ALLOY SYSTEM.
Final rept. Jun 63-Jun 69,
Ohio State Univ., Research Foundation, Columbus.
R. W. Staehle. Feb 70, 222p
Contract AT (11-1)-1319

Descriptors: (*Stress corrosion, *Nuclear reactor materials), (*Nickel chromium steels, Stress corrosion), (*Nickel chromium alloys, Stress corrosion).

For abstract, see NSA 24 20.
COO-1319-82 HC$3.00 MF$0.65

THE TRANSITION PHASE IN TiNi,
Case Western Reserve Univ., Cleveland, Ohio. Div. of Metallurgy and Materials Science.
For primary bibliographic entry see Field 20B.
For abstract, see NSA 24 20.
COO-588-19 HC$3.00 MF$0.65

DIFFUSION STUDIES IN LIQUID METALS.
Progress rept. 16 Jun 69-15 Jun 70,
Minnesota Univ., Minneapolis, Inst. of Tech.
R. A. Swalin. Jun 70, 15p
Contract AT (11-1)-841

Descriptors: (*Liquid metals, *Diffusion), Silver, Indium, Mercury, Potassium, Lithium.

For abstract, see NSA 24 20.
COO-841-20 HC$3.00 MF$0.65

STRUCTURE AND PROPERTIES OF SOLID SOLUTIONS.
Technical progress rept. 1 Sep 69-15 Jun 70,
Michigan Technological Univ., Houghton. Dept. of Metallurgical Engineering.
A. A. Hendrickson, and C. C. Chen. 26 Jun 70, 8p
Contract AT (11-1)-916

Descriptors: (*Alloys, Mechanical properties), Solid solutions, Zinc alloys, Silver alloys, Flow stress, Strain rate, Creep rate, Plastic deformation, Body centered cubic lattices, Face centered cubic lattices.

For abstract, see NSA 24 20.
COO-916-17 HC$3.00 MF$0.65

HIGH TEMPERATURE SATURATED PHASE DENSITIES AND THE CRITICAL DENSITY AND TEMPERATURE OF CESIUM,
Columbia Univ., New York. Liquid Metals Research Lab.
For primary bibliographic entry see Field 7D.
For abstract, see NSA 24 20.
CU-2660-56 HC$3.00 MF$0.65

THE CORROSION BEHAVIOUR OF COATED FUEL PARTICLES. PROJECT DRAGON,
Atomic Energy Establishment, Winfrith (England).
For primary bibliographic entry see Field 18J.
For abstract, see NSA 24 20.
DP-Report-395 HC$3.00 MF$0.65

A NEW DETERMINATION OF THE EMBRITTLEMENT IN STEEL USING SMALL SPECIMENS (APPROXIMATELY 0.2 cc) IN PARTICULAR WITH RESPECT TO IRRADIATION.
Progress rept. 1 Jan-31 Dec 69,
Metaalinstituut TNO, Delft (Netherlands).
C. Konig. 5 Feb 70, 25p EUR-4029

Descriptors: (*Steels, Embrittlement), (*Neutron irradiation, Steels), Nuclear reactor materials, Pressure vessels, Netherlands.

For abstract, see NSA 24 20.
EURAEC-2139 HC$3.00 MF$0.65

SODIUM CORROSION TESTS ON FUEL ELEMENT CANNING STEELS IN A SODIUM-COOLED FAST BREEDER REACTOR,
Division of Technical Information Extension (AEC), Oak Ridge, Tenn.
H. U. Borgstedt, G. Frees, and G. Drechsler. Aug 69, 22p
Trans. of Kernforschungszentrum, Karlsruhe. Report (West Germany) KFK-991.

Descriptors: (*Nuclear fuel cladding, *Austentic stainless steels), (*Corrosion tests, Austentic stainless steels), Sodium, Liquid metal cooled reactors, Breeder reactors, Translations, West Germany.

For abstract, see NSA 24 20.
EURFNR-753 HC$3.00 MF$0.65

THERMAL STUDY OF THREE In-Tl ALLOYS IN THE NEIGHBORHOOD OF THE F.C.T.-F.C.C. TRANSITION: HEAT CAPACITIES FROM 5 TO 300K.
Doctoral thesis,
Ames Lab., Iowa.
Robert Gerald Schwartz. May 70, 75p
Contract W-7405-eng-82

Descriptors: (*Indium alloys, Specific heat), Thallium containing alloys, Entropy, Phase transformations.

For abstract, see NSA 24 20.
IS-T-362 HC$3.00 MF$0.65

THE OPTICAL CONSTANTS OF LIQUID AMALGAMS.
Die Optischen Konstanten Von Fluessigen Amalgamen
Eidgenossische Technische Hochschule, Zurich (Switzerland).
J. Guggenheim. 1969, 50p DISS-NR-4373
Lang- in German

Descriptors: *Constants, *Mercury amalgams, *Optical measurement, *Optical reflection, Liquid metals, Mercury (metal), Surface properties.

For abstract, see STAR 08 21.
N70-37782 HC$3.00 MF$0.65

FURTHER OBSERVATIONS ON THE FORMATION OF SIGMA PHASE IN A NICKEL-BASE SUPERALLOY (IN-100).
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
R. L. Ashbrook, and R. L. Dreshfield. Sep 70, 31p NASA-TN-D-6015, E-5821
Contract 129-03

Descriptors: *Heat resistant alloys, *Metallography, *Nickel alloys, *Phase transformations, Creep rupture strength, Isothermal processes, Tensile tests, Yield strength.

For abstract, see STAR 08 21.
N70-38334 HC$3.00 MF$0.65

EFFECT OF REACTOR IRRADIATION ON DUCTILE- BRITTLE TRANSITION AND STRESS-STRAIN BEHAVIOR OF TUNGSTEN.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
G. N. Wrights, and C. L. Younger. Sep 70, 25p NASA-TN-D-5991, E-5538
Contract 122-29

Descriptors: *Brittleness, *Ductility, *Irradiation, *Stress-strain diagrams, *Tungsten, Fast neutrons, High temperature, Polycrystals, Spectroscopic analysis, Tensile properties, Thermal neutrons.

For abstract, see STAR 08 21.
N70-38376 HC$3.00 MF$0.65

STUDY OF CAVITATION DAMAGE TO HIGH-PURITY METALS AND A NICKEL-BASE SUPERALLOY IN WATER.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
S. G. Young. Sep 70, 31p NASA-TN-D-6014, E-5688
Contract 129-03

Descriptors: *Cavitation corrosion, *Metals, *Nickel alloys, *Udimet alloys, *Water, Impingement, Metallography, Ultrasonic agitation.

For abstract, see STAR 08 21.
N70-38568 HC$3.00 MF$0.65

CONTRIBUTION TO LIQUATIVE SEGREGATION BEHAVIOR IN BINARY SYSTEMS AT ARBITRARY CONCENTRATIONS.
Beitrag Zum Seigerungsverhalten in Binaeren Systemen Bei Beliebiger Konzentration
Eidgenossische Technische Hochschule, Zurich (Switzerland).
J. Troxler. 1969, 70p DISS-4264
Lang- in German

Descriptors: *Liquefaction, *Liquid metals, *Solidification, *Zone melting, Crystallography, Phase transformations.

For abstract, see STAR 08 21.
N70-38584 HC$3.00 MF$0.65

PHASES AND MIXED SYSTEMS OF TERNARY-5 (BINARY-3, BINARY-4, AND BINARY-5) ELEMENTS ESPECIALLY A COMPARISON OF AL AND GA CONTAINING PHASES.
Phasen Und Mischsysteme Der Ternaren-5 (Binaren-3, Binaren-4, Und Binaren-5) Elemente Speziell Ein Vergleich Der Al- Und Ga-haltigen Phasen
Eidgenossische Technische Hochschule, Zurich (Switzerland).
K. Girgis. 1969, 73p DISS-4357
Lang- in German, English Summary

Descriptors: *Aluminum, *Crystal structure, *Gallium, *Mixed crystals, Binary alloys, Niobi-

um alloys, Tantalum alloys, Ternary alloys, Vanadium alloys.

For abstract, see STAR 08 21.
N70-38760 HC$3.00 MF$0.65

EXPERIMENTAL AND ANALYTICAL INVESTIGATIONS ON MULTIPLE LIQUID IMPACT EROSION.
Hydronautics, Inc., Laurel, Md.
M. Gunasckaran, S. L. Rudy, and A. Thiruvengadam. Sep 70, 85p NASA-CR-1638, REPT-719-2
Contract NASW-1608
Coll- 85 P Refs

Descriptors: *Impact, *Stainless steels, *Titanium alloys, *Water erosion, Aluminum, Cavitation flow, Fatigue life, Nickel, Weibull density functions.

For abstract, see STAR 08 21.
N70-38796 HC$3.00 MF$0.65

INFLUENCE OF TITANIUM ON THE HIGH-TEMPERATURE DEFORMATION AND FRACTURE BEHAVIOR OF SOME NICKEL BASED ALLOYS,
Doctoral thesis,
Oak Ridge National Lab., Tenn.
Charles Edward Sessions. Jul 70, 189p
Contract W-7405-eng-26

Descriptors: (*Nickel alloys, Titanium containing alloys), Deformation, Fracture properties, Ductility, Creep properties, Theses.

For abstract, see NSA 24 20.
ORNL-4561 HC$3.00 MF$0.65

AN INVESTIGATION OF FAST NEUTRON RADIATION DAMAGE IN AN AUSTENITIC STAINLESS STEEL.
Doctoral thesis,
Oak Ridge National Lab., Tenn.
Everett E. Bloom. Aug 70, 175p
Contract W-7405-eng-26

Descriptors: (*Austenitic stainless steels, *Radiation damage), Fast neutrons, Theses.

For abstract, see NSA 24 20.
ORNL-4580 HC$3.00 MF$0.65

MACHINABILITY OF PLUTONIUM,
Dow Chemical Co., Golden, Colo. Rocky Flats Div.
Charles E. Durbin. 20 Jul 70, 47p
Contract AT (29-1)-1106

Descriptors: (*Plutonium, *Machinability), Machining.

For abstract, see NSA 24 20.
REP-1428 HC$3.00 MF$0.65

X-RAY STUDY OF OXIDATION OF A TERNARY ALLOY OF U-7.5% NIOBIUM-2.5% ZIRCONIUM (MULBERRY ALLOY),
Dow Chemical Co., Golden, Colo. Rocky Flats Div.
Kazuji Terada, and Henry A. Goad. 23 Jun 70, 11p
Contract AT (29-1)-1106

Descriptors: (*Uranium alloys, *Stress corrosion), X ray diffraction analysis, Niobium containing alloys, Zirconium containing alloys, Uranium oxides.
Identifiers: Uranium alloy 7.5Nb 2.5Zr.

For abstract, see NSA 24 20.
RFP-1485 HC$3.00 MF$0.65

REVIEW OF HIGH-TEMPERATURE RADIATION EMBRITTLEMENT OF ENGINEERING ALLOYS,
Aerojet-General Corp., Sacramento, Calif.
P. Studt, C. E. Dixon, and R. Baciarelli. Feb 67, 150p

Descriptors: (*Heat resistant alloys, Radiation damage), Embrittlement, Stainless steels, Nickel alloys.

For abstract, see NSA 24 20.
RN-S-365 HC$3.00 MF$0.65

HIGH-TEMPERATURE SOLUBILITY OF NITROGEN IN TUNGSTEN (Zur Hochtemperaturloeslichkeit von Stickstoff in Wolfram),
Sandia Labs., Albuquerque, N.Mex.
E. Fromm, and H. Jehn. Jun 70, 7p
Trans. of Journal of the Less-Common Metals (Netherlands) v17 p124-126 1969, by T. Watt.

Descriptors: (*Tungsten, *Dissolved gases), (*Nitrogen, Tungsten), Phase diagrams, Solubility, West Germany, Translations.
Identifiers: *Tungsten nitrides.

For abstract, see NSA 24 20.
SC-T-70-4025 HC$3.00 MF$0.65

RARE METALS.
National Science Foundation, Washington, D.C.
Special Foreign Currency Science Information Program.
For primary bibliographic entry see Field 7B.
TT-70-50021 HC$3.00 MF$0.65

VOLUME AND GRAIN BOUNDARY DIFFUSION IN IRON (Samodiffuziya Zheleza v Obeme i po Granitsam Zerna),
National Science Foundation, Washington, D.C.
Special Foreign Currency Science Information Program.
S. Z. Bokshtein. 1970, 31p SFCSI-Comm (TT-70-57048), DMDC-2893
Trans of Metallovedenie i Termicheskaya Obrabotka Metallov (USSR) n2 p2-10 1957.

Descriptors: (*Iron, *Diffusion), Grain boundaries, Diffusion coefficient, Autoradiography, USSR, Translations.

Autoradiography was used to study grain boundry and volume self diffusion in alpha and gamma-iron at 800, 1000, 1100, and 1200C. Diffusion coefficients are calculated for both cases in this somewhat qualitative study. (Author)
TT-70-57048 HC$3.00 MF$0.65

INFLUENCE OF ORDERING ON DIFFUSION OF Cd IN MgCd3 ALLOY (Vliyanie Uporyadocheniya na Diffuziyu Kadmiya v Splave MgCd3),
National Science Foundation, Washington, D.C.
Special Foreign Currency Science Information Program.
Wladyslaw Chomka. 1970, 13p SFCSI-Comm (TT-70-57051), DMDC-2913
Trans of Acta Physiologica Polonica, n24 p669-674 1963.

Descriptors: (*Cadmium, *Diffusion), Magnesium alloys, Cadmium containing alloys, Diffusion coefficient, Order disorder transformations, Translations, Poland.

The diffusion of cadmium in MgCd3 alloy was studied by using the radioactive isotope Cd115. The following temperature dependence of the diffusion coefficient for the ordered and disordered state was found: D sub 0 = .000112 exp (-12400/RT); D sub dis = 0.074 exp (-16700/RT). (Author)
TT-70-57051 HC$3.00 MF$0.65

STUDY OF DIFFUSION OF MANGANESE IN RELATION TO IMPURITIES IN TERNARY ALLOYS OF Ni-Mn- THIRD ELEMENT (Issledovanie Diffuzii Margantsa v Zavisimosti ot Primesei v Troinykh Splavakh Nikel-Marganets-Tretii Element),
National Science Foundation, Washington, D.C.
Special Foreign Currency Science Information Program.
S. D. Gertsriken, I. Ya. Dekhtyar, and L. M. Kumok. 1970, 14p SFCSI-Comm (TT-70-57059), DMDC-2945
Trans. of Akademiya Nauk URSR, Kiev. Instytut Metallofizyky. Sbornik Nauchnykh Rabot, n5 p71-77 1954.

Descriptors: (*Manganese containing alloys, Diffusion), (*Nickel alloys, Diffusion), Diffusion coefficient, Impurities, Copper containing alloys, Aluminum containing alloys, Vanadium containing alloys, Molybdenum containing alloys, Titanium containing alloys, Translations, USSR.

The effect of various impurities (Cu, Al, V, Mo, Ti) on the rate of diffusion of Manganese in nickel-manganese alloys is studied over a temperature range of 850-1050C.
TT-70-57059 HC$3.00 MF$0.65

DETERMINATION OF STRESSED AND DEFORMED STATES IN LIGHT METALS UNDER NEUTRON IRRADIATION (Ob Opredelenii Napryazhennogo i Deformirovannogo Sostoyaniya v Legkikh Metallakh pri Obluchenii Neitronami),
National Science Foundation, Washington, D.C.
Special Foreign Currency Science Information Program.
For primary bibliographic entry see Field 20L.
TT-70-57064 HC$3.00 MF$0.65

DIFFUSION OF SILVER IN IRON-PALLADIUM ALLOYS AND INTERNAL ADSORPTION OF PALLADIUM IN IRON (O Diffuzii Serebra v Splavy Zheleza s Palladiem i o Vnutrennei Adsorbtsii Palladiya v Zheleze),
National Science Foundation, Washington, D.C.
Special Foreign Currency Science Information Program.
V. I. Arkharov, and B. A. Yunikov. 1970, 13p SFCSI-Comm (TT-70-57070), DMDC-4316
Trans. of Akademiya Nauk SSSR. Doklady, v94 n6 p1057-1060 1954.

Descriptors: (*Silver, *Diffusion), (*Palladium, Adsorption), Iron alloys, Palladium containing alloys, Molybdenum containing alloys, Grain boundaries, Microhardness, Solubility, USSR, Translations.

Silver was diffused into alloys of iron with molybdenum and palladium at 940C. Grain boundary diffusion was noted microhardness readings were used to determine concentration profiles.
TT-70-57070 HC$3.00 MF$0.65

QUANTITATIVE ANALYSIS BY DIFFUSION INTO A GEL WITH A PRECIPITANT (Kolichestvennyi Analiz Putem Diffuzii Opredelyaemogo Veshchestva v Gel s Osaditelem),
National Science Foundation, Washington, D.C.
Special Foreign Currency Science Information Program.
For primary bibliographic entry see Field 7D.
TT-70-57071 HC$3.00 MF$0.65

STUDY OF KINETICS OF CHANGE IN PROPERTIES OF METALS AND ALLOYS ON HEATING BY THE METHOD OF ELASTIC VIBRATIONS (Izuchenie Metodom Uprugikh Kolebanii Kinetiki Izmeneniya Svoistv Metallov i Splavov pri Nagreve),
National Science Foundation, Washington, D.C.
Special Foreign Currency Science Information Program.

M. G. Lozinskii, and A. E. Fedorovskii. 1970, 36p
SFCSI-Comm (TT-70-57076), DMDC-4924
Trans of Akademiya Nauk SSSR. Otdelenie Tekhnicheskikh Nauk. Izvestiya, n6 p19-29 1958.

Descriptors: (*Structural steels, *Internal friction), (*Iron, Internal friction), Modulus of elasticity, Nitrogen, Heat treatment, Test equipment, Reviews, Translations, USSR.

A short review of application of dynamic methods of measuring modulus of elasticity and internal friction of metals and alloys is given; the apparatus of the new unit of the type IMASh-6 designed by the authors at the Institute of Machines, AN SSSR and meant for studying the dependence of the characteristics on temperature is described. Results of some of the experiments devoted to the study of internal friction in the process of tempering of low alloy structural steel 30KhGSA and study of peak of internal friction in iron caused by the presence of dissolved nitrogen are given. (Author)
TT-70-57076 HC$3.00 MF$0.65

EFFECTS OF SMALL AMOUNTS OF IMPURITIES ON THE PROCESS OF DISSOCIATION OF A SUPER SATURATED SOLID SOLUTION (K Voprosy o Vliyanii Malykh Primesei na Protsess Raspada Peresyshchennogo Tverdogo Rastvora),
National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.
V. I. Arkharov, and T. Yu. Goldshtein. 1970, 26p
SFCSI-Comm (TT-70-57078), DMDC-5403
Trans. of Akademiya Nauk SSSR. Uralskii Filial, Sverdlovsk. Institut Fiziki Metallov. Trudy, n11 p104-113 1950.

Descriptors: (*Silver alloys, Heat treatment), (*Copper alloys, Heat treatment), Microstructure, Annealing, Solution heat treatment, Trace elements, Antimony containing alloys, Beryllium containing alloys, Cadmium containing alloys, USSR. Translations.

The effect of a number of contaminants (antimony, beryllium, cadmium, aluminum, zinc, tin) in the concentration range of 0.1 - 0.25% on aging process of silver-copper solid solution at 300-710C was studied. It was established that antimony, beryllium and cadmium have a considerable effect on the rate of dissocation of supersaturated silver-copper solid solution; the effect of aluminum, zinc and tin in the investigated concentration range is insignificant. The relative effect of small amounts of the above mentioned elements on the kinetics of the process of dissociation of supersaturated silver-copper solid solution is intensified on decreasing the temperature. (Author)
TT-70-57078 HC$3.00 MF$0.65

ACHIEVEMENTS AND PROSPECTS OF INVESTIGATIONS ON PROBLEMS OF DIFFUSION OF SUBSTANCES IN SOLID STATE (Dostizheniya i Perspektivy Issledovateskoi Raboty nad Problemarmi Diffuzii Veshchestva v Tverdykh Telakh),
National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.
For primary bibliographic entry see Field 20L.
TT-70-57079 HC$3.00 MF$0.65

EFFECT OF SMALL AMOUNTS OF IMPURITIES (ANTIMONY AND BERYLLIUM) ON THE RATE OF DIFFUSION OF ZINC IN POLYCRYSTALLINE BRASS (O Vliyanii Malykh Primesei Surmy i Berilliya na Skorost Diffuzii Tsinka v Polikristallicheskoi Latuni),
National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.
S. A. Memnonov. 1970, 43p SFCSI-Comm (TT-70-57080), DMDC-5405
Trans. of Akademiya Nauk SSSR. Uralskii Filial, Sverdlovsk. Institut Fiziki Metallov. Trudy, n11 p90-103 1950.

Descriptors: (*Zinc, *Diffusion), Brasses, Impurities, Antimony, Beryllium, Grain boundaries, Grain size, Rates (Per time), Separation, Temperature, Translations, USSR.

The effect of grain boundry segregation of antimony and beryllium in brass on the rate of self diffusion of zinc is studied. Grain size, temperature, and composition are varied and the effects are measured.
TT-70-57080 HC$3.00 MF$0.65

EFFECT OF TRACE ELEMENTS ON PRECIPITATION IN Al-Cu ALLOYS,
California Univ., Berkeley. Lawrence Radiation Lab.
S. K. Das, G. Thomas, and D. Rowcliffe. Apr 70, 8p CONF-700809-1
Contract W-7405-eng-48
Presented at International Congress (7th) on Electron Microscopy, Grenoble (France).

Descriptors: (*Aluminum alloys, Precipitation (Chemistry)), Copper alloys, Trace elements.

For abstract, see NSA 24 20.
UCRL-19137 HC$3.00 MF$0.65

MECHANICAL PROPERTIES OF SOME METASTABLE AUSTENTIC ALLOYS.
Master's thesis,
California Univ., Berkeley. Lawrence Radiation Lab.
Dilip Bhandarkar. May 70, 75p
Contract W-7405-eng-48

Descriptors: (*Austentic steels, Mechanical properties), Metastable state, Theses.

For abstract, see NSA 24 20.
UCRL-19626 HC$3.00 MF$0.65

FIELD ION MICROSCOPY OF TANTALUM-CARBON ALLOYS,
California Univ., Berkeley. Lawrence Radiation Lab.
P. Rao. May 70, 5p CONF-701003-2
Presented at the Meeting on Electron Microscopy Society of AMERICA (28th), Houston, Tex. Oct 70.

Descriptors: (*Tantalum alloys, Electron microscopy), Interstitials, Carbon, Solid solutions, Field emission microscopes.

For abstract, see NSA 24 20.
UCRL-19630 HC$3.00 MF$0.65

DELTA AND EPSILON THERMAL EXPANSION COEFFICIENTS AND THE DELTA-TO-EPSILON CONTRACTION FOR SOME PLUTONIUM-RICH ALLOYS,
California Univ., Livermore. Lawrence Radiation Lab.
Alfred Goldberg, Robert L. Rose, and David K. Matlock. 17 Jun 70, 18p CONF-701001-2
Presented at the International Conference on Plutonium and Other Actinides (4th), Santa Fe, N.Mex. 5-9 Oct 70.

Descriptors: (*Plutonium alloys, Thermal expansion), (*Phase transformations, Plutonium alloys), Gallium containing alloys, Aluminium containing alloys, Cerium containing alloys.

For abstract, see NSA 24 20.
UCRL-72223 HC$3.00 MF$0.65

INVESTIGATION OF THE PLUTONIUM-SILVER SYSTEM,
California Univ., Livermore. Lawrence Radiation Lab.
David H. Wood, Eugene M. Cramer, and Peter L. Wallace. 19 Jun 70, 16p CONF-701001-19
Presented at the International Conference on Plutonium and Other Actinides (4th), Santa Fe, N. Mex. Oct 70.

Descriptors: (*Plutonium alloys, Phase diagrams), (*Silver alloys, Phase diagrams), Phase diagrams, Plutonium containing alloys, Silver containing alloys, Differential thermal analysis, X ray diffraction, Metallography, Eutectics.

For abstract, see NSA 24 20.
UCRL-72225 HC$3.00 MF$0.65

DEFORMATION OF CRYSTALS OF ALPHA PLUTONIUM IN COMPRESSION,
California Univ., Livermore. Lawrence Radiation Lab.
Robert G. Liptai, and Robert J. Friddle. 11 Jun 70, 12p CONF-701001-3
Presented at the International Conference on Plutonium and other Actinides (4th), Santa Fe, N. Mex. Oct 70.

Descriptors: (*Plutonium, Deformation), Crystal structure.

For abstract, see NSA 24 20.
UCRL-72507 HC$3.00 MF$0.65

EFFECT OF HOT WORKING ON ROOM-TEMPERATURE STRENGTH AND DUCTILITY OF A PLUTONIUM-1 WT% GALLIUM DELTA-STABLIZED ALLOY,
California Univ., Livermore. Lawrence Radiation Lab.
A. D. Wheeler, W. L. Thayer, and J. L. Robbins. 19 Jun 70, 18p CONF-701001-18
Presented at the International Conference on Plutonium and Other Actinides (4th), 5-9 Oct 70.

Descriptors: (*Plutonium alloys, *Hot working), Gallium containing alloys, Tensile properties, Ductility.
Identifiers: Plutonium alloy 1Ga.

For abstract, see NSA 24 20.
UCRL-72547 HC$3.00 MF$0.65

PHASE TRANSFORMATIONS IN THE ACTINIDES,
California Univ., Livermore. Lawrence Radiation Lab.
Alfred Goldberg, and Tadeusz B. Massalski. 29 Jun 70, 122p* CONF-701001-5
Presented at the International Conference on Plutonium and other Actinides (4th), Santa Fe, N. Mex. 5-9 Oct 70.

Descriptors: (*Actinide series, *Allotropy), Phase transformations, Plutonium, Uranium.

For abstract, see NSA 24 20.
UCRL-72557 HC$3.00 MF$0.65

INVESTIGATIONS IN THE NIOBIUM-NITROGEN SYSTEM. II. PRECIPITATION PROCESSES IN NIOBIUM-NITROGEN SOLID SOLUTIONS,
Bettis Atomic Power Lab., Pittsburgh, Pa.
E. Gebhardt, W. Duerrschnabel, and G. Hoerz. 1970, 26p
Trans. of Journal of Nuclear Materials (Netherlands) v18 p134-148 1966. See also Part 3, WAPD-Trans-134.

Descriptors: (*Niobium, Precipitation (Chemistry)), Nitrogen, Solid solutions, Translations, West Germany.

For abstract, see NSA 24 20.

WAPD-Trans-133 HC$3.00 MF$0.65

INVESTIGATIONS IN THE NIOBIUM-NITROGEN SYSTEM. PART III. DEGASSING KINETICS OF NIOBIUM-NITROGEN SOLID SOLUTIONS IN A HIGH VACUUM,
Bettis Atomic Power Lab., Pittsburgh, Pa.
E. Gebhardt, W. Duerrschnabel, and G. Hoerz.
1970, 22p
Trans. of Journal of Nuclear Materials (Netherlands) v18 p149-160 1966. See also Part 2, WAPD-Trans-133.

Descriptors: (*Niobium, Vacuum degassing), Nitrogen, Solid solutions, Kinetics, Translations, West Germany.

For abstract, see NSA 24 20.
WAPD-Trans-134 HC$3.00 MF$0.65

11G. Miscellaneous Materials

RESEARCH ACTIVITIES IN THE FIELD OF MATERIALS SCIENCE.
Annual technical progress rept. 1 Jun 69-31 May 70.
North Carolina Univ Chapel Hill Materials Research Center
31 May 70, 102p
Contract SD-100
See also report dated 21 May 69, AD-696 131.

Descriptors: (*Materials, Scientific research), Chemistry, Dentistry, Geology, Physics, Mass spectroscopy, Paramagnetic resonance, Nuclear magnetic resonance, Oxidation, Complex compounds, Electrochemistry, Photochemistry, Adhesives, Halides, Superconductors, Positrons, Cryogenics.
Identifiers: Polywater, Liquid crystals, Liquid helium.

The report gives very brief summaries of active research projects in chemistry, dentistry, geology, and physics.
AD-713 198 HC$3.00 MF$0.65

THE DESIGN, DEVELOPMENT AND DELIVERY OF HIGH TEMPERATURE VACUUM INSULATION SYSTEMS FOR SNAP-21 THERMOELECTRIC POWER SYSTEM.
Union Carbide Corp., Tonawanda, N.Y. Linde Div.
For primary bibliographic entry see Field 18N.
For abstract, see NSA 24 20.
TID-25482 (App.) HC$3.00 MF$0.65

11H. Oils, Lubricants, and Hydraulic Fluids

TAETIGKEITSBERICHTE 1969. FACHGEBIET 4: ANTRIEBE UND ENERGETIK (Activity Report 1969. Division 4: Propulsion and Energy Technique),
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Porz-Wahn (West Germany)
For primary bibliographic entry see Field 21E.
AD-713 210

STUDY OF EFFICIENCY OF LUBRICANTS FOR DROP FORGING,
Foreign Technology Div Wright-Patterson AFB Ohio
L. D. Demidov, and V. P. Petrunin. 18 Aug 70, 7p
Rept no. FTD-HT-23-411-70
Edited trans. of Mekhanicheskii Institut, Izhevsk. Trudy (USSR) n2 p151-157 1967, by L. Thompson.

Descriptors: (*Lubricants, *Drop forging), Wetting, Friction, Heat-resistant materials, USSR.
Identifiers: Spent sulfite liquors, Stabilizers (Agents), Translations.

A study was made of the basic factors affecting the efficiency of lubricants for drop forging. A description is given of the methods and results of a study of the wetting capacity, film adherence, as well as cooling and heat-insulation properties of 40 different lubricants such as aqueous solutions of lubricant and water suspensions of greases. Use is made of the KBZh concentrate and Na silicate as stabilizers and binders. Aqueous suspensions of greases are poor wetting agents for metal surfaces heated above 100 degrees centigrade due to the formation of vapor blocks in the contact points of lubricant drops. The film of an aqueous suspension of 3-4 percent colloidal graphite and 3-4 percent of KBZh concentrate (as a stabilizer) adhere somewhat better to the metal surface. Salt solutions cool the metal surface more drastically, while a suspension of greases with the KBZh concentrate stabilizer quickly form a solid film which is a poor heat transfer agent. The heat transfer and heat conduction coefficients are presented. (Author)
AD-713 446 HC$3.00 MF$0.65

SYNTHETIC LUBRICANT,
Foreign Technology Div Wright-Patterson AFB Ohio
E. B. Zelvyanskaya, T. M. Itsikson, L. A. Sadovnikova, N. V. Milovidova, and S. Z. Sheinina. 13 Aug 70, 5p Rept no. FTD-HT-23-352-70
Edited trans. of Patent (USSR) 229 712 2p, 10 Oct 69, by L. Thompson.

Descriptors: (*Lubricants, Synthesis (Chemistry)), Cyclohexanols, Fatty acid esters, Thermal stability, Glycols, USSR.
Identifiers: Esterification, Translations.

The proposed lubricant differs from the known in that a complex ester of dihydric cyclic alcohol and synthetic fatty acids is used as the base in it. Cyclohexanediols are used as dihydric cyclic alcohols. The thermal oxidizing stability of the proposed lubricant is greater than those previously known. (Author)
AD-713 448 HC$3.00 MF$0.65

LUBRICATING AND COOLING LIQUID FOR COLD WORKING OF METALS,
Foreign Technology Div Wright-Patterson AFB Ohio
R. I. Tarasenko, P. I. Chuyko, and A. I. Breskina. 27 Aug 70, 6p Rept no. FTD-HT-23-493-70
Edited trans. of Patent (USSR) 231 693 lp, 27 May 67, by D. Koolbeck.

Descriptors: (*Lubricants, *Cold working), Coolants, Glycols, Iron compounds, Chlorides, Wetting, USSR.
Identifiers: Ethylene glycol, Iron chlorides, Translations.

Lubricating-cooling liquid for cold-worked metals comprises (in percent wt); polyethylene glycol 20-50; Ferric chloride 10-20; wetting agent 0 5-3; water to 100. The wetting agent is an alkylarylsulphonate. The lubricant is prepared by dissolving all the constituents in water. The lubricant is applied by dipping a tube into the solution, and drying at 70-80 degrees C. This uniform layer is formed on the metal. The polyethylene glycol ensures formation of a sturdy elastic layer on the surface of the tube, and the ferric chloride having a laminated crystal lattice structure, gives better shielding of the metal surface. (Author)
AD-713 460 HC$3.00 MF$0.65

THE FORMATION OF GASES DUE TO THE SLIDING FRICTION OF TEFLON ON STEEL IN ULTRAHIGH VACUUM,
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Brunswick (West Germany)
W. Wilkens, and O. Kranz. 12 Dec 69, 14p Rept no. DFVLR-Sonderdruck-54
Availability: Pub. in Wear, v15 p215-227 1970. No copies furnished.

Descriptors: (*Halocarbon plastics, Lubricants), (*Lubricants, Vacuum), Carbon black, Composite materials, Steel, Friction, Mass spectroscopy, Decomposition, Vacuum, West Germany.
Identifiers: *Tetrafluoroethylene resins, *Filled thermoplastics, Sliding friction, Outgassing.

The formation of gases by sliding friction of self-lubricating material, Teflon filled with 25% carbon black, was investigated and the quantity and the composition of the gases evolved determined. By mass spectrometry, it was shown that all gases produced by the sliding process can be attributed to fragmentation of the Teflon molecule. At least 60% of the gases evolved during the sliding process condense on a copper surface cooled by liquid nitrogen. (Author)
AD-713 629

GENERAL ALLOY ANALYSIS WITH A GAS SHEATHED TUBULAR ELECTRODE ARC.
Technical rept. Mar 69-Mar 70,
Air Force Materials Lab Wright-Patterson AFB Ohio
James H. Muntz. Aug 70, 31p Rept no. AFML-TR-70-117

Descriptors: (*Alloys, *Chemical analysis), Aerosols, Standards, Atomic spectroscopy, Plasma jets, Electrodes, Design, Test methods.
Identifiers: *Spectroscopic analysis.

The gas sheathed tubular electrode arc has been investigated and applied to general alloy analysis. One set of six solution standards containing 18 different elements was used. Matrix effects have been mostly controlled by using a lmg/ml sample or standard in a solution containing 6mg/ml of sodium as the chloride. Fourteen different standard alloys (NBS and Alcoa) were tested, representing seven different base metals. The overall accuracy was only about plus or minus 8% deviation from the certified value. This would permit identification of alloy type, but for greater accuracy standards more closely approximating the sample should be used. Precision for the technique is normally plus or minus 3 to 4% relative standard deviation with photographic detection. (Author)
AD-713 690 HC$3.00 MF$0.65

TEMPERATURE STABILITY OF LUBRICATION LAYERS DURING FRICTION OF ALLOYED ALUMINUM ON STEEL,
Foreign Technology Div Wright-Patterson AFB Ohio
R. M. Matveevskii, and O. V. Lazovskaya. 27 Aug 70, 19p Rept no. FTD-HT-23-288-70
Edited trans. of Mashinovedenie (USSR) n6 p78-85 1968, by J. Sechovicz.

Descriptors: (*Lubricants, Wear resistance), (*Aluminum alloys, Lubricants), Friction, Stearic acids, Thermal stability, Lubricant additives, USSR.
Identifiers: Translations.

The effect exerted by various alloying elements added to AV000 aluminum on the thermal stability of the outer layer formed by D-1 lubricating oil containing 0.1 percent stearic acid was studied. The oil was spread on the aluminum surface during the frictional motion of a ShKh-9 steel ball on a circular aluminum bearing race. The chemical composition and some of the mechanical properties of the experimental specimens are summarized. All the experiments were conducted within the temperature interval of 20-360C, with the temperature changed in steps of 10-20C and the duration of each temperature step approximately 1 min. The addition of alloying elements increased the thermal longevity of the outer lubricating layer, the magnitude of the effect being proportional to the concentration of the added alloying element.
AD-713 770 HC$3.00 MF$0.65

TRANSMISSION OIL ST-20,
Foreign Technology Div Wright-Patterson AFB Ohio
V. F. Nikolaev, N. N. Zolotareva, A. E. Sokolov, A. Z. Shapiro, and G. A. Stolyarenko. 27 Aug 70, 7p Rept no. FTD-HT-23-502-70
Edited trans. of Patent (USSR) 234 589 2p, 6 Mar 67, by D. Koolbeck.

Descriptors: (*Lubricants, Transmissions), Lubricant additives, Sulfides, Phosphates, Patents, USSR.
Identifiers: Transmission fluids, Phosphonodithioic acids, Translations.

The patent involves a transmission oil having a petroleum base with DF-11 fillers - zinc dialkyldithiophosphate and sulfol-bis (trichloropentyl)sulfide. A narrow petroleum fraction having a viscosity of 4.9-5.8 centistokes at 50 degrees centigrade with a thickener of vinyl-n-butyl ester vinypol polymerizate is used as a petroleum base for the purpose of improving the operating characteristics of the oil. The oil consists of 93-94 percent by weight of Anastas'yevskaya crude fractions, 6-7 percent by weight of vinylpol, plus the following fillers (above 100 percent) DF-11, 4-5 percent by weight, and sulfol 3-4 percent by weight. (Author)
AD-713 772 HC$3.00 MF$0.65

METHOD OF PREPARING LUBRICATING OILS,
Foreign Technology Div Wright-Patterson AFB Ohio
E. A. Eminov, A. A. Falkovskaya, and Ya. A. Berenshtadt. 27 Aug 70, 7p Rept no. FTD-HT-23-501-70
Edited trans. of Patent (USSR) 211 715 2p, 16 Nov 66, by D. Koolbeck.

Descriptors: (*Lubricants, *Halogenated hydrocarbons), Chlorine, Compressors, Chlorine compounds, Lubricant additives, Wear resistance, USSR.
Identifiers: Chlorine organic compounds, Translations, *Wear inhibitors.

As is known, mineral oils are used as lubricating oils in chlorine compressors. When used in chlorine compressors under conditions of contact with the chlorine mineral oils are strongly chlorinated; the oils thicken and a large quantity of tarry residue and carbon deposits is formed. In order to provide effective operation of mineral oils in chlorine compressors it is proposed that additives consisting of Ionol and an antifoaming agent be added to their composition. To improve the antiwear properties of the lubricating oil an antiwear additive - chlorinated paraffin with a chlorine content no less than 40 wt. % - was added to the composition listed above. The obtained lubricating oil compositions provide normal operations in conditions of possible contact with chlorine. (Author)
AD-713 784 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). CASTROL OILS, INC.
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 062 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). WARWICK LABORATORIES, INC.
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 070 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). V - O MANUFACTURING COMPANY.
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 071 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). RIVERSIDE (MONTGOMERY WARD).
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 098 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). NIEHOFF AND COMPANY.
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 099 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). SEARS ROEBUCK AND COMPANY.
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 100 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). TECHNICAL CHEMICAL COMPANY.
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 101 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). UNITED CO-OPERATIVES.
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 102 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). INTERNATIONAL METAL POLISH.
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 103 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). WAGNER ELECTRIC CORPORATION.
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 104 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). UNIROYAL MERCHANDISING, INC.
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 105 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). CASTROL OILS, INC.
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 106 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). WAGNER ELECTRIC CORPORATION.
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 114 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). BOWES SEAL FAST CORP.
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 115 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). FAR BEST CORPORATION.
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 116 HC$3.00 MF$0.65

11I. Plastics

HIGH-TEMPERATURE STRUCTURAL RESINS.
Whittaker Corp San Diego Calif Narmco Research and Development Div
For primary bibliographic entry see Field 11D.
AD-713 180 HC$3.00 MF$0.65

FIELD FABRICATION OF CONTINUOUS LIGHTWEIGHT REINFORCED PLASTIC PIPE. PHASE I. LITERATURE SEARCH.
Technical rept.,
Picatinny Arsenal Dover N J
Arnold E. Molzon. Jun 70, 29p* Rept no. PA-TR-4085

Descriptors: (*Reinforced plastics, *Pipes), (*Bibliographies, Reinforced plastics), Curing agents, Polymerization, Ultraviolet radiation, Manufacturing methods, Abstracts.
Identifiers: *Plastic pipes, Linings.

A literature search has been made for references on field fabrication of reinforced thermoset plastic pipe for transporting military fuel. Sources searched include: Department of Defense, PLASTEC holdings, and the open literature. One hundred and eighteen abstracted references are listed, with an author index and subject index included. No references were found on actual production of reinforced plastic pipe in the field. Thirteen references are listed on continuous manufacture of reinforced pipe, fifteen on curing resins by ultraviolet, and eighteen on pipe linears. (Author)
AD-713 201 HC$3.00 MF$0.65

FIBRE-FILLED THERMOPLASTICS: PART I. ASBESTOS.
Explosives Research and Development Establishment Waltham Abbey (England)
For primary bibliographic entry see Field 11D.
AD-713 274 HC$3.00 MF$0.65

TIME DEPENDENCE OF STREAMING BIREFRINGENCE OF POLYSTYRENE SOLUTIONS IN AROCLOR,
Research Triangle Inst Durham N C Camille Dreyfus Lab
For primary bibliographic entry see Field 7D.
AD-713 287

CRYOGENIC MATERIALS DATA HANDBOOK (REVISED). VOLUME II. SECTIONS D, E, F, G, H AND I.
Martin Marietta Corp Denver Colo Denver Div
For primary bibliographic entry see Field 11F.
AD-713 620 HC$10.00 MF$0.65

RAPID LINEAR PYROLYSIS OF COMPOSITE SOLID PROPELLANT INGREDIENTS.
Vitro Labs., Silver Spring, Md.
For primary bibliographic entry see Field 7C.
For abstract, see STAR 08 21.
N70-37786 HC$3.00 MF$0.65

11J. Rubbers

PREPARATION OF FLUOROELASTOMERS FOR USE WITH CRYOGENIC STORABLE PROPELLANTS FINAL REPORT, 1 FEB. 1968 - 31 JAN. 1969.
Peninsular Chemresearch, Inc., Gainesville, Fla.
For primary bibliographic entry see Field 7C.
For abstract, see STAR 08 21.

N70-38192 HC$3.00 MF$0.65

11L. Wood and Paper Products

DESIGN OF WOOD AIRCRAFT STRUCTURES.
Munitions Board, Washington, D.C. Aircraft Committee.
For primary bibliographic entry see Field 1C.
AD-490 100 HC$3.00

ZUR VISKOSITATSKORRIGIERUNG DES FILTERWERTES VON VISKOSEN (Correction of Viscosity of the Filter Constants of Viscose),
Svenska Traforskningsinstitutet Stockholm
Erich Treiber, and Ove Lidbrandt. 13 Jun 69, 4p Rept nos. Meddelande-41, MA-27
Text in German.
Availability: Pub. in Faserforschung und Textiltechnik, v20 n9 p452-453 1969. No copies furnished.

Descriptors: (*Cellulose, Viscosity), (*Viscose, Viscosity), Mathematical analysis, Liquid filters, Sweden.
Identifiers: *Filterability, *Cellulose xanthate.
AD-713 332

UNTERSUCHUNGEN UBER DEN ZERFASERUNGSWIDERSTAND ABGEPRESSTER ALKALICELLULOSEBLATTER (Investigations of the Shredding Resistance of Sheets of Pressed Alkali Cellulose),
Svenska Traforskningsinstitutet Stockholm
von Istvan Czajlik, and Erich Treiber. 18 Jan 69, 6p Rept nos. Meddelande-16, MA-9
Text in German.
Availability: Pub. in Svensk Papperstidning, v72 n5 p133-137 1969. No copies furnished.

Descriptors: (*Cellulose, Cutting), (*Wood pulp, Cutting), Mechanical properties, Sweden.
Identifiers: *Shredding, Shredders.

By the aid of an apparatus, simulating the alkali cellulase, AC, shredding in a Pfleiderer shredder and measuring the work needed for tearing apart a sheet of pressed alkali cellulose, the shredding resistance of the AC of different pulp samples was investigated. The influence of different parameters, like press ratio, temperature and resin contents on the result was studied at the same time. (Author)
AD-713 333

UBER TEMPERATURUNTERSCHIEDE IN DER ALKALIZELLULOSE BEI DER FASERXANTHOGENIERUNG (The Temperature Difference in Alkali Cellulose During Xanthation of the Fibers),
Svenska Traforskningsinstitutet Stockholm
For primary bibliographic entry see Field 7D.
AD-713 345

BEITRAG ZUR KENNTNIS DER WAERMETOENUNG DER XANTHOGENIERUNGSREAKTION. (Contribution to the Knowledge of the Heat of Reaction of the Xanthation Process),
Svenska Traforskningsinstitutet Stockholm
For primary bibliographic entry see Field 7D.
AD-713 346

REGLERFORSOK MED INLOPPSLADEMODELL (Pilot Tests on Papermill Control Systems),
Svenska Traforskningsinstitutet Stockholm
For primary bibliographic entry see Field 13H.
AD-713 347

BILDNING AV ILLALUKTANDE AMNEN VID SULFATKOK (Formation of Malodorous Compounds in the Sulphate Process),
Svenska Traforskningsinstitutet Stockholm
Nils Hartler, Kjell Andersson, and Jan G. T. Bergstrom. 1969, 8p Rept nos. Meddelande-4, MA-1
Text in Swedish.
Availability: Pub. in Kemisk Tidskrift, n2 p22-27 1969. No copies furnished.

Descriptors: (*Wood pulp, *Odors), (*Cellulose, *Sulfides), Sweden.
Identifiers: *Sulfate pulping, *Sulfidization.

Vid Institutionen for cellulosateknik, KTH, har en serie forsok gjorts for att undersoka bildningen av organiska svavelforeningar vid sulfatkokning av ved. I denna del av arbetet redogors for nagra mojligheter att minska bildningen av illaluktande amnen genom modifiering av koksattet. (Author)
AD-713 349

MATNING AV POROSITET PA LOPANDE BANA (Measuring Porosity in the Production Line),
Svenska Traforskningsinstitutet Stockholm
Gunnar Gavelin. 5 Jun 69, 6p Rept nos. Meddelande-31, PA-9
Text in Swedish.
Availability: Pub. in Svensk Papperstidning, v72 n15 p477-480 1969. No copies furnished.

Descriptors: (*Paper, Porosity), Measuring devices (Electrical + electronic), Monitors, Sweden.

The report presents a description of a device for measuring the porosity of paper, designed by B. Jender and B. Lindstrom and manufactured by AB Lorentzen and Wettres Maskinaffar.
AD-713 351

CHEMICAL DEGRADATION OF WOOD: THE RELATIONSHIP BETWEEN STRENGTH RETENTION AND PENTOSAN CONTENT.
Technical rept.,
Yale Univ New Haven Conn School of Forestry
Adelaide Kass, F. F. Wangaard, and H.A. Schroeder. Dec 69, 11p Rept no. TR-44
Contract Nonr-609 (13)
Prepared in cooperation with Colorado State Univ., Fort Collins.
Availability: Pub. in Wood and Fiber, v2 n1 p31-30 Spring 1970.

Descriptors: (*Wood, Chemical reactions), Degradation, pH, Cellulose.
Identifiers: *Pentosans, Hemicellulose.

The investigation resulted from a prior study on the effect of acids and alkalis on wood. In that study, indirect support was given the contention that a low original pentosan content in wood favors resistance to chemical degradation. In the present study, the relationship of pentosan content and its retention to the resistance of wood to chemical attack is quantitatively established. A low original pentosan content and a high pentosan retention correlate well with resistance to acid degradation as measured by strength retention. The relationship between these two pentosan values and alkaline degradation is weaker, but still significant. Hemicellulose retention is a better indicator of the behavior of wood with respect to alkaline attack. The most useful result is the fact that, through chemical analysis for pentosans in a wood, resistance to chemical degradation can be indicated. (Author)
AD-713 409

WASHINGTON MILL SURVEY 1968: WOOD CONSUMPTION AND MILL CHARACTERISTICS.
Rept. no. 1.,
Pacific Northwest Forest and Range Experiment Station, Portland, Oreg.
John A. Bergvall, and Donald R. Gedney. Jun 70, 132p PNW-Misc-70134
Prepared in cooperation with Washington State Dept. of Natural Resources, Olympia. Paper copy available from Pacific Northwest Forest and Range Experiment Station, P. O. Box 3141, Portland, Oreg. 97208. FREE.

Descriptors: (*Wood, Consumption), (*Sawmills, *Washington (State)), (*Wood products, Washington (State)), Production, Plywood, Wood pulp, Millwork, Wood wastes, Lumber.
Identifiers: *Lumber industry, Wood processing industry.

The document presents the findings of a survey of wood consumption by Washington's primary wood processing industries for the year 1968 and differs from earlier surveys in that it includes information on the charcteristics of the processing facilities. (Author)
PB-195 032 MF$0.65

12. MATHEMATICAL SCIENCES

12A. Mathematics and Statistics

THE ROBUSTNESS OF THE STUDENT t TEST WHEN SAMPLING FROM A WEIBULL DISTRIBUTION.
Master's thesis,
Naval Postgraduate School Monterey Calif
David P. Allen. Sep 70, 36p

Descriptors: (*Statistical tests, Sensitivity), Statistical distributions, Experimental design, Life expectancy, Reliability, Simulation, Sampling, Tables, Theses.
Identifiers: *Weibull density functions, *T test, Robust procedures, Computerized simulation, Life tests.

When testing with the t-test, it is assumed that the sample under investigation is from a normal population. The purpose of this thesis is to examine the sensitivity of the t-test to violations of this normality assumption. A computer simulation was performed to draw sets of 10,000 samples from an infinite Weibull population. A t-test was performed on each sample to test the null hypothesis H sub 0: mu = or < mu sub 0 where mu sub 0 was the true mean of the Weibull population. The number of times that H sub 0 was rejected was recorded for all combinations of eight levels of significance, samples ranging in size from 2 to 31, and for values of the parameters of the distribution lambda = 1,2,3 and beta = 1,2,3. (Author)
AD-713 074 HC$3.00 MF$0.65

AN AD HOC BAYESIAN METHOD FOR DETERMINING LOWER CONFIDENCE LIMITS.
Master's thesis,
Naval Postgraduate School Monterey Calif
John Courtney Cartland, Jr. Sep 70, 65p

Descriptors: (*Confidence limits, Mathematical prediction), (*Reliability, Determination), Decision theory, Computer programs, Probability, Simulation, Theses.
Identifiers: Bayesian analysis, Beta density functions, Beta function.

The thesis proposes and analyzes an ad hoc Bayesian method for determining lower confidence limits for estimates of mission reliability of single components using pass/fail test data. Several test sequences with different underlying reliabilities are simulated. After each trial the lower confidence limits are calculated using the Classical method, the Bayesian method and the proposed method. This is followed by an accuracy simulation to estimate the accuracy of the proposed method. The proposed method shows promise for future usefulness in that it is capable of demonstrating a high degree of reliability with a relatively small number of trials while maintaining some degree of protection against accepting unreliable components. (Author)

AD-713 075 HC$3.00 MF$0.65

A METHOD OF CLUSTER ANALYSIS.
Master's thesis,
Naval Postgraduate School Monterey Calif
William Michael Cima. Jun 70, 76p

Descriptors: (*Statistical analysis, Classification), (*Pattern recognition, Mathematical prediction), Nonlinear programming, Analysis of variance, Groups (Mathematics), Curve fitting, Computer programs, Theses.
Identifiers: *Cluster analysis, Clumps, Histograms.

A method of cluster analysis is presented in which points in n-dimensional space are analyzed through a subdivisive procedure. The points are orthogonally projected onto that line which maximizes their variance and the resulting point distribution is then analyzed with the use of a histogram. Wherever possible, divisions between conglomerates of points are made and each separate clump is subsequently analyzed. Ultimately adjacent groups are combined and analyzed through an analogous technique in an effort to re-unite any points which may have inadvertently deviated from the group with which they truly associate. The method is later refined to allow the detection of groups in several point dispersions which would have appeared as a single conglomeration under the original method. An example is given to illustrate the applicability of the procedure. (Author)
AD-713 076 HC$3.00 MF$0.65

TABLES OF TOROIDAL HARMONICS, III: FUNCTIONS OF THE FIRST KIND--ORDERS 0-10.
Final rept.,
Aerospace Research Labs Wright-Patterson AFB Ohio
Henry E. Fettis, and James C. Caslin. Jul 70, 399p* Rept no. ARL-70-0127
See also report dated Dec 69, AD-701 729.

Descriptors: (*Special functions (Mathematical), Tables), Rings (Mathematics), Potential theory, Magnetic fields, Electric fields.
Identifiers: *Toroidal harmonics, *Legendre functions.

The report contains eleven-figure tables of the Legendre function of the first kind (P sub (n-1/2), sup m) (s) for integral values of n and m. It is a continuation of the previous two volumes which gave values of the functions of the second kind, (Q sub (n-1/2), sup m) (s) also for integers n and m. As in the previous tables, the argument s is given directly and also as cosh eta. The tables are so constructed that the degree n-1/2 covers the same range as in the previous reports. (Author)
AD-713 103 HC$3.00 MF$0.65

AN INTEGRAL EQUATION FOR UNSTEADY SURFACE WAVES AND A COMMENT ON THE BOUSSINESQ EQUATION.
California Univ Berkeley Div of Aeronautical Sciences
For primary bibliographic entry see Field 20D.
AD-713 107 HC$3.00 MF$0.65

ON LARGE-SAMPLE PROPERTIES OF CERTAIN NON-PARAMETRIC PROCEDURES.
Technical rept.,
Purdue Univ Lafayette Ind Dept of Statistics
Herman Rubin. Sep 70, 17p Rept no. Mimeograph Ser-238
Contract N00014-67-A-226-0008

Descriptors: (*Statistical analysis, Decision theory), Statistical distributions, Statistical tests, Stochastic processes, Monte Carlo method, Sampling.
Identifiers: *Nonparametric statistics, Kolmogorov-Smirnov test, Statistical decision theory, Kuiper test, Risk.

It is shown that for large samples, say on the order of 10 to the 10th power or 10 to the 20th power, that asymptotic results for the risk efficiencies of certain non-parametric two-sided test procedures are not too close to the actual values, and the asymptotically largest corrections are even, in some cases, of the wrong sign. It is also shown for the two-sided case that certain test procedures which have Pitman efficiency 0 have good risk efficiencies and should be considered. For the one-sided case, a symmetric Kolmogorov-Smirnov procedure is found to be better, and in some cases much better, than the corresponding one-sided test. (Author)
AD-713 110 HC$3.00 MF$0.65

PRACTICAL USE OF THE FAST FOURIER TRANSFORM (FFT) ALGORITHM IN TIME-SERIES ANALYSIS.
Technical rept.,
Texas Univ Austin Applied Research Labs
Carol Webb. 22 Jun 70, 205p* Rept no. ARL-TR-70-22
Contract NObsr-95181

Descriptors: (*Time series analysis, Power spectra), (*Integral transforms, *Programming (Computers)), Fourier analysis, Confidence limits, Statistical distributions, Subroutines, Algorithms.
Identifiers: *Fast Fourier transform, *Fourier transformation, CDC 3200 computers, FORTRAN, *Spectrum analysis, Degrees of freedom.

The report serves as documentation for a collection of basic time-series analysis programs written for the CDC 3200 digital computers. These programs are predominantly written in FORTRAN and can be easily adapted to other digital computers. These programs are constructed around the fast Fourier transform (FFT) ALGORITHM. Rather than rediscuss the theory of the FFT algorithm, which is adequately described in the existing literature, this report deals with the practical aspects of the use of the FFT. The problems that can and in many instances do occur in computing spectral estimates are also addressed on the basis of an extensive literature review. (Author)
AD-713 166 HC$3.00 MF$0.65

HISTORICAL SIMULATION: A PROCEDURE FOR THE EVALUATION OF ESTIMATING PROCEDURES. VOLUME I. PROCEDURE DEVELOPMENT AND DESCRIPTION.
General Research Corp Santa Barbara Calif
For primary bibliographic entry see Field 12B.
AD-713 174 HC$3.00 MF$0.65

APPLICATION OF WALSH TRANSFORM TO STATISTICAL ANALYSIS,
California Univ Los Angeles School of Engineering and Applied Science
Judea Pearl. Aug 70, 43p Rept no. UCLA-ENG-7072
Contract N00014-69-A-0200-4027

Descriptors: (*Statistical analysis, Transformations (Mathematics)), (*Information theory, Pattern recognition), Fourier analysis, Groups (Mathematics), Set theory, S-matrix, Statistical distributions, Harmonic analysis, Integral transforms.
Identifiers: *Walsh transformation, Central limit theorem, Asymptotic density functions, Fourier transformation, Probability distribution functions.

Harmonic analysis of probability distribution functions has long served an important function in the treatment of stochastic systems. The tasks of generating moments and distributions of sums have effectively been executed in the Fourier spectrum. This paper explores the properties of the Walsh-Hadamard transform of probability functions of discrete random variables. Many analogies can be drawn between Fourier and Walsh analysis; in particular, it is shown that moments can be generated taking the Gibb's derivative of the Walsh spectrum, and products of Walsh spectra yield the distribution of dyadic sums. Stochastic systems with dyadic symmetry would benefit most from the properties of Walsh analysis and the computational advantages it offers. Some applications in the areas of Information Theory and Pattern Recognition are demonstrated. (Author)
AD-713 194 HC$3.00 MF$0.65

NONLINEAR BIFURCATION,
California Inst of Tech Pasadena
Herbert B. Keller. 3 Feb 69, 21p AROD-7625:11-M
Contract DAHC04-68-C-0006
Availability: Pub. in Jnl. of Differential Equations, v7 n3 p417-434 May 70.

Descriptors: (*Nonlinear differential equations, Integration), Partial differential equations, Boundary value problems, Iterative methods, Asymptotic series, Perturbation theory, Convergence, Theorems.
Identifiers: *Elliptic differential equations, Bifurcation theory.

The report discusses problems of the form (a) Lu + lambda (lambda, x, u) = 0, x is included in D; (b) Bu = 0, x is included in the boundary of D, for a very wide class of linear elliptic operators L, say of order 2m, and linear boundary operators B, of order m. For convenience only, the linear problem is considered to be self-adjoint. (Author)
AD-713 206

POSITIVE SOLUTIONS OF NONLINEAR ELLIPTIC EIGENVALUE PROBLEMS,
California Inst of Tech Pasadena
R. Bruce Simpson, and Donald S. Cohen. 1970, 20p AROD-7625:3-M
Contract DAHC04-68-C-0006, Grant NSF-GP-7978
Availability: Pub. in Jnl. of Mathematics and Mechanics, v19 n10 p895-910 1970.

Descriptors: (*Nonlinear differential equations, Integration), (*Partial differential equations, *Conduction (Heat transfer)), Temperature, Theorems.
Identifiers: Elliptic differential equations, Existence theorems, Eigenvalues.

The paper presents the results of a study of a class of mildly nonlinear elliptic eigenvalue problems, which were suggested by several recently occurring problems concerning the steady state temperature distribution of a physical medium in which heat is being generated nonlinearly. (Author)
AD-713 227

NEWTON'S METHOD UNDER MILD DIFFERENTIABILITY CONDITIONS,
California Inst of Tech Pasadena
Herbert B. Keller. 1 Jul 68, 17p AROD-7625:9-M
Contract DAHC04-68-C-0006
Availability: Pub. in Jnl. of Computer and System Sciences, v4 n1 p15-28 Feb 70.

Descriptors: (*Differential equations, Integration), (*Iterative methods, Convergence), Operators (Mathematics), Banach space, Convex sets, Theorems.
Identifiers: Newton method, Existence theorems, Uniqueness theorems.

The author discusses Newton's method for determining the solution of f (x)=0 when f (x) is required only to be continuous and piecewise continuously differentiable in some sphere about the initial iterate, x sup (0). (Author)
AD-713 239

ASYMPTOTIC SOLUTIONS OF INITIAL VALUE PROBLEMS FOR NONLINEAR PARTIAL DIFFERENTIAL EQUATIONS,
New York Univ N Y

Joseph B. Keller, and Stanley Kogelman. 3 Jun 69, 15p AROD-5669:10-M
Contract DA-31-124-ARO (D)-361
Availability: Pub. in SIAM Jnl. of Applied Mathematics, v18 n4 p748-758 Jun 70.

Descriptors: (*Nonlinear differential equations, Integration), (*Partial differential equations, Wave functions), Initial value problems, Boundary value problems, Perturbation theory, Asymptotic series, Hilbert space, Stability.
Identifiers: Wave equations, *Van der Pol differential equation, Periodic functions.

The problem discussed is an initial boundary value problem for a nonlinear wave equation. Detailed results are obtained for a particular equation which may be viewed as a generalized van der Pol equation. The boundary value problem for this equation possesses infinitely many periodic solutions or limit cycles, asymptotic expansions of which were found by Millman and Keller. It is seen that in general the solution of the initial value problem tends to one of these periodic solutions, and for given initial data it is shown which one. However, for certain special initial conditions, the solution tends to a combination of a finite number of periodic solutions. These special solutions are unstable, and only the individual periodic solutions are stable. (Author)
AD-713 266

A REMARK ON ROYDEN'S COMPACTIFICATION OF RIEMANNIAN SPACES,
California Univ Los Angeles
I-Hsiung Lin. 2 Mar 70, 7p AROD-6929:31-M
Grants DA-ARO-D-31-124-70-G7, DA-ARO (D)-31-124-G855
Availability: Pub. in Kodai Mathematical Seminar Reports, v22 n3 p338-340 Sep 70.

Descriptors: (*Algebraic topology, Theorems), Complex variables.
Identifiers: *Riemannian manifolds, Harmonic functions, Riemann surfaces, Royden compactification.

In the development of the theory of Royden's Compactification of Riemann surfaces, maximum principles for harmonic functions play a key role. These principles were established by means of the double of a bordered subregion of a Riemann surface. In the case of a higher dimensional Riemannian space, the double of a bordered subregion is, however, not available without losing the smoothness of the metric. Although the theory in Chapter 3 in the monograph Sario, L., and M. Nakai, Classification Theory of Riemann Surfaces, Springer-Verlag (1970), 446p., can be reproduced for higher dimensional Riemannian spaces with discontinuous metric, including the one concerning doubling, it is also worthwhile to consider the smooth metric. The purpose of this paper is to replace a theorem, known for Riemann surfaces, by another so that all fundamental theorems in Chapter 3 of Sario-Nakai, such as the maximum principles and the decomposition theorem, can be extended verbatim to higher dimensional Riemannian spaces. (Author)
AD-713 285

ON PROBLEMS WITH BOUNDED STATE VARIABLES,
California Univ Berkeley
I. B. Russak. 12 Aug 69, 46p AROD-5863:20-M
Contract DA-31-124-ARO (D)-355
Supersedes Rept. no., AD-672 528.
Availability: Pub. in Jnl. of Optimization Theory and Applications, v5 n2 p114-157 Feb 70.

Descriptors: (*Control systems, Mathematical models), (*Calculus of variations, Problem solving), Differential equations, Integral equations, Matrix algebra, Optimization, Theorems.
Identifiers: Bolza problem.

A set of first-order necessary conditions is obtained for the general control problem of Bolza with bounded state constraints of the form (phi sup alpha) (t,x) = or < 0, alpha = 1,..., m. With the solution required to satisfy the vector differential equations dx/dt = f (t,x,u), where u is control, an important feature of this paper is in relaxing the assumption on the rank of the matrix (phi sub x, sup alpha) (f sub u) generally made in attacking problems of this type. This is accomplished even though the solution may have an infinite number of intervals satisfying (phi sup alpha) (t,x) = 0 for various alpha. (Author)
AD-713 289

DEGREE REALIZATION OF UNDIRECTED GRAPHS IN REDUCED FORM,
California Univ Berkeley Electronics Research Lab
J. N. Ayoub, and I. T. Frisch. 1970, 14p AROD-7144:14-RT
Contract DAHC04-67-C-0046
Availability: Pub. in Jnl. of the Franklin Institute, v289 n4 p303-312 Apr 70.

Descriptors: (*Graphics, Algorithms), Set theory, Theorems.
Identifiers: *Graph theory, Decomposition method.

Necessary and sufficient conditions are given for a set of non-negative integers to be the degrees of vertices of an n-vertex undirected graph. The conditions and their proof are based on a novel decomposition procedure which gives some insight into the structure to be realized, and leads to a simple and efficient algorithm to construct the graph directly with a minimum number of parallel branches and a minimum number of self-loops. In the case in which the given set is not realizable, the algorithm determines the least modification necessary for the resulting set to be realizable. (Author)
AD-713 299

CRAMER-RAO EFFICIENCIES OF BEST LINEAR INVARIANT ESTIMATORS OF PARAMETERS OF THE EXTREME-VALUE DISTRIBUTION UNDER TYPE II CENSORING FROM ABOVE,
Rocketdyne Canoga Park Calif Mathematics and Statistics Research Div
Nancy R. Mann. 12 Aug 68, 15p ARL-70-0210W
Contract F33615-70-C-1216
Revision of report dated 15 Dec 65.
Availability: Pub. in SIAM Jnl. on Applied Mathematics, v17 n6 p1150-1162 Nov 69.

Descriptors: (*Statistical analysis, Decision theory), (*Reliability, Mathematical prediction), Statistical distributions, Exponential functions, Life expectancy, Sampling, Theorems.
Identifiers: Weibull density functions, Extreme value density functions, Maximum likelihood estimation, Parameter estimation, Life tests.

If, in life testing, failure time has the two-parameter Weibull distribution, then the random variable log failure time has the first asymptotic distribution of smallest (extreme) values. Let loss be squared error divided by the square of a scale parameter of this distribution, and consider linear estimators, with expected loss invariant under location and scalar transformations, of parametric functions of a distribution location parameter u and scale parameter b. It has been shown that the best among these linear invariant estimators can be calculated as a function of the best linear unbiased (BLU) estimators of u and b and their covariance matrix. Moreover the expected loss of any best linear invariant (BLI) estimator is uniformly less than that of the corresponding BLU estimator. In the present paper expressions are derived for Cramer-Rao bounds for the mean squared error of regular invariant estimators, of parametric functions of general location and scale parameters, based on the first r ordered observations from a size n random sample, 2 = or < r = or < n. These expressions are used to calculate efficiencies of the BLI estimators for 10 percent points of the first asymptotic distribution of smallest values. (Author)
AD-713 314

EINSTEIN TENSOR AND GENERALIZATIONS OF BIRKHOFF'S THEOREM,
Temple Univ Philadelphia Pa Dept of Physics
For primary bibliographic entry see Field 20J.
AD-713 320

SMOOTHING, FILTERING, AND BOUNDARY EFFECTS,
Air Force Cambridge Research Labs L G Hanscom Field Mass
Ralph Shapiro. 14 May 69, 30p Rept no. AFCRL-70-0524
Availability: Pub. in Reviews of Geophysics and Space Physics, v8 n2 p359-387 May 70.

Descriptors: (*Nonlinear differential equations, Integration), (*Low-pass filters, Design), Numerical methods and procedures, Fourier analysis, Data processing systems, Weather forecasting, Partial differential equations, Difference equations.
Identifiers: Filtering theory, Smoothing (Mathematics), *Numerical integration, Finite difference theory.

Numerical integrations of finite-difference analogs of systems of nonlinear partial differential equations, such as those arising in atmospheric dynamics, are subject to computational instability from a variety of causes. One type of instability is produced by a spurious, nonlinear growth of high-frequency components that may be introduced by roundoff, truncation, and observational error. This type of instability, first discussed by N. A. Phillips, can be suppressed by a suitable choice of finite-difference method or by the use of a filter that selectively damps the high-frequency components. Though much effort is being devoted to the development of stable finite-difference procedures, and considerable success has been achieved, all such methods involve high-frequency smoothing either implicitly or explicitly. It is therefore important that the effects of such filtering be fully understood. Filtering and smoothing operators are developed for use in conjunction with the numerical integration of nonlinear systems and for other purposes. (Author)
AD-713 331

A SELECTION PROCEDURE FOR MULTIVARIATE NORMAL DISTRIBUTIONS IN TERMS OF THE GENERALIZED VARIANCES,
Purdue Research Foundation Lafayette Ind
Mrudulla Gnanadesikan, and S. S. Gupta. Aug 68, 17p ARL-70-0217W
Contract F33615-67-C-1244
Prepared in cooperation with Bell Telephone Labs., Murray Hill, N. J. Revision of report dated May 68.
Availability: Pub. in Technometrics, v15 n1 p103-117 Feb 70.

Descriptors: (*Statistical distributions, *Multivariate analysis), Population (Mathematics), Selection, Decision theory, Probability.
Identifiers: Normal density functions, *Ranking, Statistical decision theory.

The present paper discusses some ranking and selection procedures for multivariate normal populations in terms of measures of dispersion. Using the generalized variance as the measure of dispersion, a procedure is defined to select a subset of the populations which would include the population with the smallest generalized variance with a certain probability. Two approximations to the distribution of the sample generalized variance are discussed. A discussion of the properties of the above procedure is also included. (Author)
AD-713 334

ON THE DISTRIBUTION OF THE MAXIMUM AND MINIMUM OF RATIOS OF ORDER STATISTICS,
Purdue Univ Lafayette Ind
R. E. Barlow, S. S. Gupta, and S. Panchapakesan.
13 May 68, 20p ARL-70-0186W
Contracts F33615-67-C-1244, Nonr-1100 (26)
Prepared in cooperation with California Univ., Berkeley, Contract Nonr-3656 (18).
Availability: Pub. in The Annals of Mathematical Statistics, v40 n3 p918-934 1969.

Descriptors: (*Statistical distributions, Selection), Distribution functions, Distribution theory, Probability, Sampling, Tables.
Identifiers: *Order statistics, *Ranking.

Let Xi (i = 0,1,...,p) be (p+1) independent and identically distributed nonnegative random variables each representing the jth order statistic in a random sample of size n from a continuous distribution G (x) of a nonnegative random variable. Let (G sub j,n) (x) be the cumulative distribution function of Xi (i = 0,1,...,p). Consider the ratios Yi = Xl/Xo (i = 1,2,...,p). The random variables Yi (i = 1,2,...,p) are correlated and the distribution of the maximum and the minimum is of interest in problems of selection and ranking for restricted families of distribution. Th distribution-free subset selection rules using the percentage points of these order statistics are investigated in a companion paper by Barlow and Gupta (1969). In the present paper, the distribution of these statistics is discussed in general, for any G (x) and then derive specific results for G (x) = 1 - e to the power (-x/theta), x > 0, theta > 0. Section 2 deals with the distribution of the maximum while Section 3 discusses the distribution of the minimum. Some asymptotic results are given in Section 4, while Section 5 describes the tables of the percentage points of the two statistics. (Author)
AD-713 337

RANDOMIZED RULES FOR THE TWO-ARMED-BANDIT WITH FINITE MEMORY,
Purdue Univ Lafayette Ind
S. M. Samuels. 22 Jan 68, 8p ARL-70-0187W
Contract AF 33 (657)-11737
Availability: Pub. in The Annals of Mathematical Statistics, v39 n6 p2103-2107 1968.

Descriptors: (*Probability, Problem solving), (*Decision theory, Sequential analysis), Stochastic processes.
Identifiers: Two armed bandit with finite memory problem, Two armed bandit problem, Coin tossing.

In the 'two-armed-bandit with finite memory' problem, each rule which has been proposed can be improved by using a corresponding randomized rule. The performance of various randomized rules is computed. (Author)
AD-713 344

COHOMOLOGY OPERATIONS AND POSTNIKOV SYSTEMS.
Final rept. 15 Nov 63-31 Aug 70,
Johns Hopkins Univ Baltimore Md
Jean-Pierre Meyer. 31 Aug 70, 9p AROD-2799:14-M
Contract DA-31-124-ARO (D)-176

Descriptors: (*Algebraic topology, Reviews), Monoids.
Identifiers: *Homology and cohomology theory, Adams spectral sequence, Postnikov systems.

A brief summary is given of an investigation of the structure of Postnikov systems and their relationship to the computation of obstructions. (Author)
AD-713 388 HC$3.00 MF$0.65

ERGODIC PROPERTIES OF POPULATIONS I: THE ONE SEX MODEL,
California Univ Berkeley Dept of Computer Sciences
For primary bibliographic entry see Field 6C.
AD-713 393

FUNCTION APPROXIMATION ROUTINES FOR BRLESC - A SURVEY.
Ballistic Research Labs Aberdeen Proving Ground Md
For primary bibliographic entry see Field 9B.
AD-713 396 HC$3.00 MF$0.65

SOME ASPECTS OF THE METHOD OF THE HYPERCIRCLE APPLIED TO ELLIPTIC VARIATIONAL PROBLEMS.
Technical summary rept.,
Wisconsin Univ Madison Mathematics Research Center
Jean Pierre Aubin, and Hermann G. Burchard. Sep 69, 76p Rept no. MRC-TSR-1005
Contract DA-31-124-ARO (D)-462

Descriptors: (*Partial differential equations, Integration), (*Boundary value problems, Approximation (Mathematics)), Numerical analysis, Difference equations, Hilbert space, Theorems.
Identifiers: Elliptic differential equations, Sobolev space, Spline functions, Finite difference theory, Dirichlet problem.

The hypercircle method is studied from the point of view of the recently developing theory of Galerkin-type approximations in Sobolev spaces using spline functions. Given an elliptic boundary value problem it is shown how to obtain a conjugate problem - thereby interchanging the roles of 'forced' and 'natural boundary conditions. Given approximate solutions for both problems their errors can be estimated 'a posteriori'. The approximate solution of the primal problem being well-known, the authors consider the approximation of the solution of the conjugate problem, obtaining theorems of convergence and estimates of the rate of convergence. (Author)
AD-713 434 HC$3.00 MF$0.65

AN AXIOMATIC APPROACH TO ROUNDED COMPUTATIONS.
Technical summary rept.,
Wisconsin Univ Madison Mathematics Research Center
U. Kulisch. Nov 69, 34p Rept no. MRC-TSR-1020
Contract DA-31-124-ARO (D)-462

Descriptors: (*Numerical analysis, Programming (Computers)), Approximation (Mathematics), Set theory, Theorems.
Identifiers: Computation, Interval arithmetic, Arithmetic.

The present paper is intended to give an axiomatic approach to rounded computations. A rounding is defined as a monotone mapping of an ordered set into a subset, which in general is called a lower respectively an upper screen. The first chapter deals with roundings in ordered sets. In the second chapter further properties of roundings in linearly ordered sets are studied. The third chapter deals with the two most important applications, the approximation of the real arithmetic on a finite screen and the approximation of the real interval arithmetic on an upper screen. Beyond these examples various further applications are possible. (Author)
AD-713 435 HC$3.00 MF$0.65

WAKE CURVATURE AND THE KUTTA CONDITION.
Wisconsin Univ Madison Mathematics Research Center
For primary bibliographic entry see Field 20D.
AD-713 436 HC$3.00 MF$0.65

AN EXTENSION OF THE GENERALIZED INVERSE OF A MATRIX.
Technical summary rept.,
Wisconsin Univ Madison Mathematics Research Center
R. E. Cline, and T. N. E. Greville. Mar 70, 18p
Rept no. MRC-TSR-1034
Contract DA-31-124-ARO (D)-462

Descriptors: (*Matrix algebra, Numerical analysis), Theorems.
Identifiers: Matrix inversion.

For any complex matrix expressed as a product A = BCD, a 'product generalized inverse' (a generalization of the Moore-Penrose inverse) is defined and its properties developed. (Author)
AD-713 437 HC$3.00 MF$0.65

SYMMETRIZATION OF MATRICES BY DIAGONAL MATRICES.
Technical summary rept.,
Wisconsin Univ Madison Mathematics Research Center
Pedro Nowosad. Jan 70, 14p Rept no. MRC-TSR-1038
Contract DA-31-124-ARO (D)-462

Descriptors: (*Matrix algebra, Theorems), Real variables, Permutations, Numerical analysis.
Identifiers: Eigenvalues.

The report gives an analytical proof via the Perron-Frobenius theorem of a theorem of Hearon, and Parter and Youngs, about symmetrization of matrices by diagonal similarity and implements a related theorem of Goldberg. (Author)
AD-713 438 HC$3.00 MF$0.65

ASYMPTOTIC THEORY OF NONLINEAR WAVE MOTIONS IN MAGNETOHYDRODYNAMICS. PART I. SURFACE WAVES.
Wisconsin Univ Madison Mathematics Research Center
For primary bibliographic entry see Field 20I.
AD-713 439 HC$3.00 MF$0.65

SOLUTION OF LANDAU'S PROBLEM CONCERNING HIGHER DERIVATIVES ON THE HALFLINE.
Technical summary rept.,
Wisconsin Univ Madison Mathematics Research Center
I. J. Schoenberg, and Alfred Cavaretta. Mar 70, 29p Rept no. MRC-TSR-1050
Contract DA-31-124-ARO (D)-462

Descriptors: (*Functional analysis, Theorems), Approximation (Mathematics), Numerical analysis, Interpolation, Inequalities.
Identifiers: Landau problem, Spline functions, Chebychev functions.

Let f (x) be defined for 0 = or < x < infinity and let M sub nu = sup/ (f sup nu) (x)/ (nu = 0,..., n). Assuming (M sub 0) and (M sub n) to be finite, the best constants (C sub n, nu) in the inequalities (M sub nu) = or < (C sub n, nu) ((M sub 0, sup (1-nu/n)) (M sub n, sup (nu/n))), 0 < nu < n are determined. (Author)
AD-713 440 HC$3.00 MF$0.65

GLOBAL APPROXIMATION OF A COMPACT SET BY ELEMENTS OF A CONVEX SET IN A NORMED SPACE.
Technical summary rept.,
Wisconsin Univ Madison Mathematics Research Center
P. J. Laurent, and Pham-Dinh-Tuan. Dec 70, 30p
Rept no. MRC-TSR-1052
Contract DA-31-124-ARO (D)-462

Descriptors: (*Functions, *Approximation (Mathematics)), Numerical analysis, Convex sets, Topology, Theorems.

The problem of the simultaneous approximation of a compact set of functions by an element of a convex set is considered in an arbitrary normed space

and then in three particular function spaces. (Author)
AD-713 441 HC$3.00 MF$0.65

LINEAR EQUATIONS OVER A COMMUTATIVE RING.
Technical summary rept.,
Wisconsin Univ Madison Mathematics Research Center
Paul Camion, L. S. Levy, and H. B. Mann. Apr 70, 33p Rept no. MRC-TSR-1060
Contract DA-31-124-ARO (D)-462

Descriptors: (*Matrix algebra, *Rings (Mathematics)), Groups (Mathematics), Determinants, Theorems.
Identifiers: Modules (Mathematics), *Linear algebra.

Let A denote a n x m matrix over a commutative ring R and let x and l be n-rowed column vectors with elements in a module over R. Necessary and sufficient conditions are found that the equation Ax = l has a solution. (Author)
AD-713 442 HC$3.00 MF$0.65

BIRKHOFF REDUCTION OF TWO-DIMENSIONAL LINEAR DIFFERENTIAL SYSTEMS AT A SINGULAR POINT.
Technical summary rept.,
Wisconsin Univ Madison Mathematics Research Center
W. B. Jurkat, and D. A. Lutz. Apr 70, 37p Rept no. MRC-TSR-1062
Contract DA-31-124-ARO (D)-462

Descriptors: (*Differential equations, Meromorphic functions), Analytic functions, Transformations (Mathematics), Matrix algebra, Integration, Theorems.
Identifiers: *Linear differential equations, Ordinary differential equations, Canonical forms.

Two-dimensional systems of linear differential equations are considered in a neighborhood of a pole of the coefficient matrix. A linear transformation is applied to the system which simplifies the expansion of the coefficient matrix which is then said to be in a modified Birkhoff canonical form. Solutions of the transformed system are 'equivalent' to those of the original system in the sense that they display common singular behavior in a neighborhood of the pole. Some information about the solutions can be read directly from the canonical form. (Author)
AD-713 443 HC$3.00 MF$0.65

THE STUDY OF PROOFS AND ORDINALS.
Final rept. 1 Oct 69-30 Jun 70,
Stanford Univ Calif Dept of Mathematics
Solomon Feferman, and G. Kreisel. 1970, 5p
AROD-2379:30-M
Grants DA-ARO (D)-31-124-G985, DA-ARO (D)-31-124-G1094

Descriptors: (*Mathematical logic, Reports), Recursive functions, Problem solving.

The results of a project devoted to the study and characterization of various stratifications of the notions of mathematical proofs and definitions are briefly summarized. (Author)
AD-713 462 HC$3.00 MF$0.65

FURTHER RESULTS ON 'SIMULTANEOUS TEST PROCEDURES UNDER GENERAL MANOVA MODELS',
Aerospace Research Labs Wright-Patterson AFB Ohio
P. R. Krishnaiah. 1969, 4p ARL-70-0211V
Availability: Pub. in Bulletin of the International Statistical Institute, p306-307 1969.

Descriptors: (*Multivariate analysis, Statistical tests), Matrix algebra, Mathematical models, Decision theory.
Identifiers: Hypothesis testing, Covariance.

The author considers testing various hypotheses simultaneously under a general MANOVA model when the sums of squares and cross product matrices associated with these hypotheses are not independently distributed. (Author)
AD-713 465

PARTIALLY DISCRETE NUMERICAL SOLUTION OF THE GENERALIZED DIFFUSION EQUATION.
Doctoral thesis,
California Univ Los Angeles Dept of Mathematics
Sam Pierce. Sep 70, 76p Rept no. TR-70-2
Contract N00014-69-A-0200-4022

Descriptors: (*Partial differential equations, Initial value problems), (*Integration, Numerical analysis), Least squares method, Diffusion, Algorithms, Theorems, Theses.
Identifiers: Delta function, *Diffusion theory.

The document contains a study of the partially discrete numerical solution and its convergence for the diffusion equation with any generalized function initial condition including the delta function. (Author)
AD-713 487 HC$3.00 MF$0.65

A DETERMINISTIC VIEW OF SPECTRUM AND CROSS-SPECTRUM ANALYSIS,
Army Coastal Engineering Research Center Washington D C
For primary bibliographic entry see Field 8C.
AD-713 534 HC$3.00 MF$0.65

THE ISOTONIC REGRESSION PROBLEM AND ITS DUAL,
California Univ Berkeley Operations Research Center
R. E. Barlow, and H. D. Brunk. Aug 70, 32p Rept no. ORC-70-29
Contract N00014-69-A-0200-1036
Prepared in cooperation with Stanford Univ., Calif., Grant NSF-GP-17172 and Oregon State Univ., Corvallis, Dept. of Statistics.

Descriptors: (*Statistical analysis, Decision theory), (*Inventory control, Mathematical models), Stochastic processes, Convex sets, Theorems.
Identifiers: Isotonic regression, Maximum likelihood estimation.

The isotonic regression problem is to minimize Summation, i = 1 to k of (((g sub i) - (x sub i)) squared (w sub i)) subject to (x sub i) = or < (x sub j) when i * j where g sub i and w sub i > 0 (i = 1,2, ..., k). The solution is called the isotonic regression on g. A generalization of this problem is formulated and its Fenchel dual is calculated. A function of the isotonic regression also solves these problems. Problems in inventory theory and statistics are identified as dual isotonic regression problems. (Author)
AD-713 592 HC$3.00 MF$0.65

ON CONSTRUCTION OF FRACTIONAL REPLICATES AND ON ALIASING SCHEMES.
Technical summary rept.,
Wisconsin Univ Madison Mathematics Research Center
U. B. Paik, and W. T. Federer. Jan 70, 48p Rept no. MRC-TSR-1029
Contract DA-31-124-ARO (D)-462

Descriptors: (*Combinatorial analysis, Theorems), Matrix algebra, Experimental design, Tables.
Identifiers: Fractional replication, Factorial designs, Factorials.

A generalized method of constructing irregular fractional replicates from a complete factorial is developed. An invariance property and an aliasing structure property of fractional replicate plans are presented. (Author)
AD-713 696 HC$3.00 MF$0.65

A COMPUTER PROGRAM FOR INTERACTIVE MANIPULATION OF FINITE GROUP PRESENTATIONS.
Technical summary rept.,
Wisconsin Univ Madison Mathematics Research Center
F. D. Crary. Feb 70, 131p Rept no. MRC-TSR-1045
Contract DA-31-124-ARO (D)-462

Descriptors: (*Groups (Mathematics), *Programming (Computers)), Computer programs, Theorems.
Identifiers: Group theory, Group computer program.

An interactive computer program for manipulating finite group presentations is described. A brief mathematical background is provided along with operating instructions and notes on the programming. An illustrative example is included. (Author)
AD-713 697 HC$3.00 MF$0.65

THE KANTOROVICH THEOREM AND ERROR ESTIMATES FOR NEWTON'S METHOD.
Technical summary rept.,
Wisconsin Univ Madison Mathematics Research Center
Louis B. Rall, and Richard A. Tapia. Feb 70, 19p Rept no. MRC -TSR-1043
Contract DA-31-124-ARO (D)-462

Descriptors: (*Iterative methods, Errors), Numerical analysis, Banach space, Sequences, Convergence, Theorems.
Identifiers: *Newton method, Kantorovich theorem.

In this note the authors derive a simple recurrence relation for the best possible error estimates the Kantorovich theorem can give for Newton's method. This formulation has, as immediate consequences, all previously derived error estimates and some improved error estimates. (Author)
AD-713 698 HC$3.00 MF$0.65

BEST POSSIBLE FLOATING POINT ARITHMETIC.
Technical summary rept.,
Wisconsin Univ Madison Mathematics Research Center
J. M. Yohe. Mar 70, 32p Rept no. MRC-TSR-1054
Contract DA-31-124-ARO (D)-462

Descriptors: (*Numerical analysis, Accuracy), (*Programming (Computers), Algorithms), Approximation (Mathematics), Errors.
Identifiers: *Floating point operation, Interval arithmetic, Computation, Arithmetic.

The report presents an algorithm for floating point arithmetic, using single-length arithmetic registers, which yields the most accurate approximation which can be expressed in the given floating point format, the greatest lower bound, or the least upper bound for the result of the operation, whichever is specified by the programmer. This makes the algorithm particularly useful for implementation of interval arithmetic. (Author)
AD-713 699 HC$3.00 MF$0.65

DISCRETE SPLINES VIA MATHEMATICAL PROGRAMMING.
Technical summary rept.,
Wisconsin Univ Madison Mathematics Research Center
O. L. Mangasarian, and L. L. Schumaker. Jan 70, 32p Rept no. MRC-TSR-1028
Contract DA-31-124-ARO (D)-462

Descriptors: (*Mathematical programming, Functions), Linear programming, Nonlinear programming, Convex sets, Optimization, Polynomials, Theorems.
Identifiers: *Spline functions, Spline interpolation, Riemannian manifolds, Existence theorems, Uniqueness theorems, Kuhn-Tucker theory.

Mathematical programming is used to investigate constrained minimization problems in real Euclidean space which are the discrete analogs of spline problems posed as minimization problems in a Banach space. Existence, uniqueness, characterizing properties and computational methods are given. (Author)
AD-713 700 HC$3.00 MF$0.65

ON THE BIRKHOFF-TURRITTIN TRUNCATION PROBLEM FOR SYSTEMS OF ORDINARY LINEAR DIFFERENTIAL EQUATIONS.
Technical summary rept.,
Wisconsin Univ Madison Mathematics Research Center
Donald A. Lutz. Dec 69, 26p Rept no. MRC-TSR-1023
Contract DA-31-124-ARO (D)-462

Descriptors: (*Differential equations, Integration), Analytic functions, Meromorphic functions, Transformations (Mathematics), Matrix algebra, Asymptotic series, Linear systems, Theorems.
Identifiers: Ordinary differential equations, Linear differential equations.

The Birkhoff-Turrittin truncation problem consists of the application of a linear transformation to a system of linear ordinary differential equations at a singular point of pole type which has the effect of truncating the expansion of the new coefficient. The degree of truncation is not known in general. For the case of systems having a regular singular point, a bound on the degree of truncation is established which extends Turrittin's result of the case of a simple pole. (Author)
AD-713 701 HC$3.00 MF$0.65

ON EXTREMAL PROBLEMS RELATED TO EIGENVALUES OF LINEAR DIFFERENTIAL OPERATORS. I.
Technical summary rept.,
Wisconsin Univ Madison Mathematics Research Center
Pedro Nowosad. Sep 69, 77p Rept no. MRC-TSR-1016
Contract DA-31-124-ARO (D)-462

Descriptors: (*Differential equations, *Complex variables), Perturbation theory, Matrix algebra, Membranes, Vibration, Optimization, Theorems.
Identifiers: Extremal problems, Linear differential equations, Comparison theorems, Vibrating strings, Eigenvalues.

The report discusses the problem of extremization of Re lambda, say, in the equation Ax = lambda rho (x), where A is a linear differential operator, x epsilon X, rho epsilon Q, with X and Q two suitable set of functions, under the additional condition the integral over rho = 1. A comparison theorem involving equalities is proved which brings to light the existence of an analytical structure in the problem. Several applications to concrete cases are given. (Author)
AD-713 706 HC$3.00 MF$0.65

NUMERICAL SOLUTION OF WAVEGUIDE SCATTERING PROBLEMS BY FINITE-DIFFERENCE GREEN'S FUNCTIONS,
Massachusetts Inst of Tech Cambridge Research Lab of Electronics
For primary bibliographic entry see Field 20N.
AD-713 749

BOUNDS AND ASYMPTOTES FOR THE PERFORMANCE OF MULTIVARIATE QUANTIZERS,
Massachusetts Inst of Tech Cambridge Research Lab of Electronics
Peter Elias. 21 Aug 69, 11p
Contract DA-28-043-AMC-02536 (E)
Availability: Pub. in Annals of Mathematical Statistics, v41 n4 p1249-1259 1970.

Descriptors: (*Measure theory, Theorems), Information theory, Multivariate analysis, Set theory, Inequalities.
Identifiers: Data processing, Probability measures.

The author discusses the minimization of a measure of the error introduced by a quantizer Q having a fixed number K of quantizing regions by varying the shapes of the regions. The results require that the probability measure mu have compact support, vanishing outside some cube in E sup n. However one does not need the absolute continuity of mu or the boundedness of its density f; one obtains firm lower bounds which are also estimates asymptotic in K, there are no unknown constants for general N and r, and the results extend to r = 0 and r = infinity.
AD-713 750

REPRESENTING NATURAL-LANGUAGE INFORMATION IN PREDICATE CALCULUS,
Stanford Univ Calif Dept of Computer Science
Erik J. Sandewall. Jul 70, 27p Rept nos. CS-166, AIM-128
Contract SD-183
Report on Stanford Artificial Intelligence Project.

Descriptors: (*Mathematical logic, *Semantics), (*Artificial intelligence, Feasibility studies), Algebras.
Identifiers: Predicate calculus, Boolean algebra.

A set of general conventions are proposed for representing natural language information in many- sorted first order predicate calculus. The purpose is to provide a testing-ground for existing theorem-proving programs. (Author)
AD-713 841 HC$3.00 MF$0.65

THE QUAD SCHEME: A NEW METHOD FOR PHASE SPACE INTEGRATION,
Argonne National Lab., Ill.
For primary bibliographic entry see Field 20L.
For abstract, see NSA 24 20.
ANL-7556 HC$3.00 MF$0.65

METHODS OF COMPUTING FLUID MOTION IN TWO-DIMENSIONAL CARTESIAN OR CYLINDRICAL COORDINATES BY FOLLOWING LAGRANGIAN ENERGY CELLS,
Los Alamos Scientific Lab., N. Mex.
For primary bibliographic entry see Field 20D.
For abstract, see NSA 24 20.
LA-4464 HC$3.00 MF$0.65

SELF-ADJOINT ALGEBRAS OF UNBOUNDED OPERATORS,
Pennsylvania Univ., Philadelphia. Dept. of Physics.
For primary bibliographic entry see Field 20J.
For abstract, see NSA 24 20.
NYO-2171-318 HC$3.00 MF$0.65

STABILIZATION OF OPTIMAL DIFFERENTIAL METHODS FOR NUMERICAL INTEGRATION OF ORDINARY DIFFERENTIAL EQUATIONS.
Stabilisierung Optimaler Differenzenverfahren Zur Numerischen Integration Gewoehnlicher Differentialgleichungen
Eidgenossische Technische Hochschule, Zurich (Switzerland).
H. Brunner. 1969, 86p DISS-4182
Contract NRC G-A4805
Lang- in German

Descriptors: *Differential equations, *Numerical integration, *Optimization, Analysis (mathematics), Operational calculus.

For abstract, see STAR 08 21.
N70-38582 HC$3.00 MF$0.65

GROUP THEORY, PART 1 - LECTURE NOTES 1 - 7.
International Centre for Theoretical Physics, Trieste (Italy).
J. Niederle. Nov 69, 113p IC/69/140
Conf- Presented At the Intern. Centre for Theoret. Phys. Advanced School of Phys., Trieste, Feb.-mar. 1969

Descriptors: *Completeness, *Group theory, *Lectures, *Lie groups, *Representations, Operators (mathematics), Orthogonality, Set theory.

For abstract, see STAR 08 21.
N70-38681 HC$3.00 MF$0.65

BROKEN CHIRAL AND CONFORMAL SYMMETRY IN AN EFFECTIVE LAGRANGIAN FORMALISM.
International Centre for Theoretical Physics, Trieste (Italy).
C. J. Isham, A. Salam, and J. Strathdee. Apr 70, 21p IC/70/17
Subm- Submitted for Publication

Descriptors: *Chiral dynamics, *Conformal mapping, *Symmetry, Field theory (physics), Invariance, Lagrange multipliers, Mass, Nonlinear systems.

For abstract, see STAR 08 21.
N70-38993 HC$3.00 MF$0.65

NUMERICAL STABILITY IN PROBLEMS IN LINEAR ALGEBRA,
Maryland Univ., College Park. Inst. for Fluid Dynamics and Applied Mathematics.
Ivo Babuska. Jun 70, 33p BN-663 CONF-700617-1
Presented at the SIAM National Meeting, Denver, Colo. Jun 70.

Descriptors: (*Linear algebraic equations, Numerical analysis), Computation, Computer programming, Stability.

For abstract, see NSA 24 20.
ORO-3443-28 HC$3.00 MF$0.65

MODIFIED QUASILINEARIZATION AND OPTIMAL INITIAL CHOICE OF THE MULTIPLIERS. PART 1 - MATHEMATICAL PROGRAMMING PROBLEMS,
Rice Univ., Houston, Tex. Aero-Astronautics Group.
A. Miele, and A. V. Levy. 1970, 33p AAR-76
Grant NSF-GP-18522
See also Part 2, PB-194 867.

Descriptors: (*Functions, Optimization), (*Mathematical programming, Algorithms), (*Iterative methods, Convergence), Numerical analysis, Iterations, Approximation (Mathematics).
Identifiers: *Quasilinearization, Modified quasilinearization, Computer aided analysis, Lagrange multipliers.

The problem of extremizing a function f (x) subject to the constraint Phi (x)=0 is considered. Here, f is a scalar, x an n-vector, and Phi a q-vector. A modified quasilinerization algorithm is developed; its main property is a descent property in the performance index R, the cumulative error in the constraint and the optimum condition. Modified quasilinearization differs from ordinary quasilinearization because of the inclusion of a scaling factor (or stepsize) alpha in the system of variations. The stepsize alpha is determined by a

one-dimensional search so as to ensure the decrease in the performance index R; this can be achieved through a bisection process starting from alpha = 1. Convergence is achieved when R becomes smaller than some preselected value. In order to start the algorithm, some nominal values for the variable x and the multiplier lambda must be chosen. Two numerical examples are presented, and it is shown that, if the initial multiplier is chosen optimally, modified quasilinearization converges to the solution. (Author)
PB-194 866 HC$3.00 MF$0.65

MODIFIED QUASILINEARIZATION AND OPTIMAL INITIAL CHOICE OF THE MULTIPLIERS. PART II - OPTIMAL CONTROL PROBLEMS,
Rice Univ., Houston, Tex. Aero-Astronautics Group.
A. Miele, R. R. Iyer, and K. H. Well. 1970, 51p AAR-77
Grant NSF-GP-18522
See also Part 1, PB-194 866.

Descriptors: (*Functions, Optimization), (*Control systems, Mathematical models), (*Differential equations, Integration), Approximation (Mathematics), Calculus of variations, Iterative methods, Convergence, Algorithms.
Identifiers: *Quasilinearization, Modified quasilinearization, *Control theory, Computer aided analysis, Lagrange multipliers, Two point boundary value problems.

The paper considers the problem of extremizing a functional I which depends on the state x (t), the control u (t), and the parameter pi. The state is an n-vector, the control is an m-vector, and the paramet is a p-vector. At the initial point, the state is prescribed. At the final point, the state and the parameter are required to satisfy q scalar relations. Along the interval of integration, the state, the control, and the parameter are required to satisfy n scalar differential equations. A modified quasilinearization algorithm is developed; its main property is a descent property in the performance index R, the cumulative error in the constraints and the optimum conditions. (Author)
PB-194 867 HC$3.00 MF$0.65

AN AUTHOR AND PERMUTED TITLE INDEX TO SELECTED STATISTICAL JOURNALS.
Special publication,
National Bureau of Standards, Washington, D.C.
Brian L. Joiner, N. F. Laubscher, Eleanor S. Brown, and Bert Levy. Sep 70, 511p* NBS-SP-321
Paper copy also available from Superintendent of Documents, GPO, Washington, D.C. 20402. $5.75 as C13.10:321

Descriptors: (*Indexes (Documentation), *Statistics), (*Statistics, *Periodicals), Authors, Bibliographies.
Identifiers: KWIC indexes.

Over 5,000 articles appearing in the indicated issues of the following journals are indexed: 'Annals of Mathematical Statistics' (1961-1969), 'Biometrics' (1965-1969 No. 3), 'Biometrika' (1951-1969), 'Journal of the American Statistical Association' (1956-1969), 'Journal of the Royal Statistical Society, Series B' (1954-1969 No. 2), 'South African Statistical Journal' (1967-1969 No. 2), 'Technometrics' (1959-1969). The articles indexed correspond to those appearing since the most recent cumulative subject index was published for the first six named journals, while for 'Technometrics' all articles were included even though a subject index exists for the first seven volumes. The index consists of three sections, an author index, a permuted title index and a bibliographic listing. In the permuted title index each article is listed under every important word appearing in its title. This index should consequently serve many of the functions of a conventional subject index. The author index is similar to a conventional author index. (Author)
PB-194 963 HC$5.75 MF$0.65

12B. Operations Research

THE INFINITE SERVER QUEUE WITH POISSON ARRIVALS AND SEMI-MARKOVIAN SERVICES.
Technical rept.,
Purdue Univ Lafayette Ind Dept of Statistics
Marcel F. Neuts, and Shun-Zer Chen. Aug 70, 23p Rept no. Mimeograph Ser-237
Contract Nonr-1100 (26)
Prepared in cooperation with Voorhees Coll., Denmark, S. C.

Descriptors: (*Queueing theory, Statistical processes), Matrix algebra, Random variables, Probability, Set theory, Distribution functions.
Identifiers: Markov processes, Poisson processes, Markov chains, M/G/infinity queue.

The queue with an infinite number of servers with a Poisson arrival process and with semi-Markovian service times is considered. The queue length process and the type of the first customer to join the queue after time t are studied jointly and the transient and asymptotic results are obtained which are of matrix extensions of the corresponding results of the M/G/infinity queue. In particular, it is proven that the limiting distribution of the queue length process is Poisson. (Author)
AD-713 109 HC$3.00 MF$0.65

DEADLOCK-FREE SHARING OF RESOURCES IN ASYNCHRONOUS SYSTEMS.
Doctoral thesis,
Massachusetts Inst of Tech Cambridge Dept of Electrical Engineering
Prakash G. Hebalkar. Sep 70, 186p Rept no. MAC-TR-75
Contract Nonr-4102 (01)

Descriptors: (*Scheduling, Mathematical models), (*Management planning, Multiple operation), Decision theory, Queueing theory, Data processing systems, Transportation, Maintenance, Graphics, Inequalities, Theorems, Theses.
Identifiers: *Resource allocation, Asynchronous systems, Asynchronous computers, MAC project, Multiprocessing.

Whenever resources are shared among several activities that hoard resources, the activities can attain a state of deadlock in which, for lack of resources, none of the activities can proceed. Deadlocks can be prevented by coordination of the sharing. Efficient running of the activities under such coordination requires knowledge of the patterns of use of resources by the activities. This thesis presents a study of deadlock prevention in systems in which a knowledge of the usage of resources by the activities during several phases of steady resource usage is available. A representation called a demand graph is presented and used for the study of deadlocks. The model is a general one and encompasses systems in which the activities themselves consist of more than one sequence of phases and are not necessarily independent of each other. The analysis is applicable to computer systems as well as systems in the realm of operations research. (Author)
AD-713 139 HC$3.00 MF$0.65

EQUILIBRIUM AND DEMAND FOR MEDIA OF EXCHANGE IN A PURE EXCHANGE ECONOMY WITH TRANSACTIONS COSTS,
Yale Univ New Haven Conn Cowles Foundation for Research in Economics
For primary bibliographic entry see Field 5C.
AD-713 143 HC$3.00 MF$0.65

HISTORICAL SIMULATION: A PROCEDURE FOR THE EVALUATION OF ESTIMATING PROCEDURES. VOLUME I. PROCEDURE DEVELOPMENT AND DESCRIPTION.
Final rept.,
General Research Corp Santa Barbara Calif
C. A. Graver. Jun 69, 157p Rept no. GRC-CR-0364-1
Contract DAHC15-68-C-0364

Descriptors: (*Statistical analysis, Operations research), (*Cost effectiveness, Mathematical prediction), Regression analysis, Least squares method, Monte Carlo method, Armed forces procurement, Defense systems, Models (Simulations), Probability, Matrix algebra, Decision theory, Distribution functions, Correlation techniques, Programming (Computers), Costs.
Identifiers: *Historical simulation, Cost estimates, Estimation theory.

A recurring problem faced by many analysts is that of devising estimating procedures for predicting some aspect of the future from rather meager data. This is particularly true for the cost analyst who is concerned with estimating the resource requirements of future military systems. Historical Simulation is a method of evaluating candidate (cost) estimating procedures on the basis of their ability to simulate predictions using data that would have been available. In this fashion, Historical Simulation avoids relying on the central evaluation assumption of Regression Theory, namely, that which fits the past data best will predict the future best. This conceptual difference gives Historical Simulation several unique features. (Author)
AD-713 174 HC$3.00 MF$0.65

THE TRANSPORTATION PROBLEM WITH OPTIMIZATION OF THE ORIGINS.
Texas A and M Univ College Station Inst of Statistics
For primary bibliographic entry see Field 15E.
AD-713 213 HC$3.00 MF$0.65

OPTIMALITY CONDITIONS AND CONSTRAINT QUALIFICATIONS IN BANACH SPACE.
Technical rept.,
North Carolina Univ Chapel Hill Dept of Statistics
F. J. Gould, and Jon W. Tolle. Aug 70, 23p Rept no. Mimeo Ser-707
Contract N00014-67-A-0321-0003

Descriptors: (*Nonlinear programming, Banach space), Convex sets, Hilbert space, Topology, Optimization, Theorems.
Identifiers: Kuhn-Tucker theory, Constraints.

Necessary optimality conditions for non-linear programs in Banach spaces and constraint qualifications for their applicability are considered. A new optimality condition is introduced and a constraint qualification ensuring the validity of this condition is given. When the domain space is a reflexive space, it is shown that the qualification is the weakest possible. If a certain convexity assumption is made, then this optimality condition is shown to reduce to the well-known extension of the Kuhn-Tucker conditions to Banach spaces. In this case the constraint qualification is weaker than those previously given. (Author)
AD-713 220 HC$3.00 MF$0.65

ASYMPTOTIC PROPERTIES OF CUMULATIVE PROCESSES.
Research rept.,
California Univ Berkeley Operations Research Center
Sheldon M. Ross, and Mark Brown. Sep 70, 24p Rept no. ORC-70-31
Contracts DA-31-124-ARO (D)-331, N00014-69-A-0200-1010
Prepared in cooperation with Cornell Univ., Ithaca, New York, Grant NSF-GK-5758.

Descriptors: (*Stochastic processes, Theorems), Set theory, Random variables, Asymptotic series, Convergence, Distribution theory, Sequences, Queueing theory.
Identifiers: Renewal theory, Regenerative processes, Cumulative processes.

The theory of cumulative processes, introduced and developed by W. L. Smith, provides a significant generalization of the renewal counting process. One examines the question of extending the Blackwell and key renewal theorems to cumulative processes. For a subclass of cumulative processes, which one calls strongly cumulative, the Blackwell and key renewal theorems hold under very general conditions. This class of cumulative processes includes all the standard examples of cumulative processes. One also studies processes of the form Y (t) = the integral from o to t V (s)ds where V is a regenerative process. Smith has shown that under mild conditions V (s) converges in distribution, say to V (infinity), as s approaches infinity, and that Y (t)/t converges almost surely and in expectation to Kappa sub 1/mu sub 1 (a constant). The result is that Kappa sub 1/mu sub 1 = EV (infinity). This holds even if lim as t approaches infinity, of EV (t) does not exist. (Author)
AD-713 391 HC$3.00 MF$0.65

NONCONVEX LINEAR PROGRAMMING.
Doctoral thesis,
Case Western Reserve Univ Cleveland Ohio Dept of Operations Research
Robert E. Fricks. Sep 70, 138p Rept no. TM-200
Contract DAHC19-68-C-0007

Descriptors: (*Linear programming, Algorithms), Simplex method, Optimization, Decision theory, Theses.
Identifiers: Themis project, Nonconvex programming.

An algorithm for solving the 'nonconvex linear programming problem' Maximize z = cx, Subject to: (A sub i)x = or < (b sub i), 1 = 1,...,p for at least one i, x = or > 0 is given. The problem is viewed as one of n-dimensional geometry with the union of the p distinct solution sets a general nonconvex (possibly disconnected) polyhedral set. A continuous path in n-space is generated which passes from solution set to solution set as the optimum is sought. The core of the solution procedure is a 'linking linear program' which is a efficient, highly flexible substitute for Phase I of the simplex method. Given an arbitrary linear programming problem in n decision variables and having m constraints, the linking linear program solution approach can conceivably produce an optimum basic feasible solution with little more computational effort than minimum (n,m)+1 'simplex' pivot operations. (Author)
AD-713 484 HC$3.00 MF$0.65

THE ISOTONIC REGRESSION PROBLEM AND ITS DUAL,
California Univ Berkeley Operations Research Center
For primary bibliographic entry see Field 12A.
AD-713 592 HC$3.00 MF$0.65

HOW TO STORE IT,
Rand Corp Santa Monica Calif
For primary bibliographic entry see Field 9B.
AD-713 617 HC$3.00 MF$0.65

COALITIONS IN N-PERSON ESSENTIAL GAMES.
Research rept.,
Texas Univ Austin Center for Cybernetic Studies
A. Charnes, and S. Sorensen. Jun 70, 20p Rept no. CS-28
Contracts N00014-67-A-0126-0008, N00014-67-A-0126-0009

Descriptors: (*Game theory, Linear programming), Set theory, Optimization, Theorems.
Identifiers: Essential games, Bargaining.

A notion of a solution of an n-person essential game is developed based on the core of a game. This solution exists for every essential game but is not unique. A bargaining procedure is developed which gives some insight into which coalitions may actually form. It can be characterized by means of linear programs. (Author)
AD-713 693 HC$3.00 MF$0.65

DISCRETE SPLINES VIA MATHEMATICAL PROGRAMMING.
Wisconsin Univ Madison Mathematics Research Center
For primary bibliographic entry see Field 12A.
AD-713 700 HC$3.00 MF$0.65

TOM TIDDLER'S GAME.
Internal memo.,
General Research Corp Santa Barbara Calif
P. J. Redmond. May 67, 31p Rept no. GRC-IMR-611
Contract DAAH01-67-C-1334, ARPA Order-958-67

Descriptors: (*Game theory, Optimization), Differential equations, Minimax technique, Algorithms, Evasion.
Identifiers: Pursuit evasion games, *Tom Tiddler game.

A number of attackers try to reach a goal guarded by several goalies. The goalies and attackers approach each other with fixed velocity but can maneuver transversely within a specified velocity range. The largest miss distance between an attacker and the nearest goalie at the termination of the game is determined for an arbitrary initial deployment of the goalies and the attackers. Optimal strategies and optimal initial placements for the defense and attack are determined. The problem may be generalized so that the constraints are on the mth time derivative of the position vector. For the free evasion problem a simple transformation reduces the problem to one involving velocity constraints. (Author)
AD-713 713 HC$3.00 MF$0.65

MODIFIED QUASILINEARIZATION AND OPTIMAL INITIAL CHOICE OF THE MULTIPLIERS. PART 1 - MATHEMATICAL PROGRAMMING PROBLEMS,
Rice Univ., Houston, Tex. Aero-Astronautics Group.
For primary bibliographic entry see Field 12A.
PB-194 866 HC$3.00 MF$0.65

13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING

13A. Air Conditioning, Heating, Lighting, and Ventilating

HEAT EXCHANGERS IN NUCLEAR POWER PLANTS,
Naval Intelligence Command Alexandria Va Translation Div
For primary bibliographic entry see Field 18I.
AD-713 423 HC$3.00 MF$0.65

ENGINEERING AND COST ANALYSIS OF MARINE AIR CONDITIONING SYSTEMS (Tekhniko-Ekonomicheskii Analiz Sudovykh Sistem Konditsionirovaniya Vozdukha),
Naval Intelligence Command Alexandria Va Translation Div
For primary bibliographic entry see Field 13J.
AD-713 424 HC$3.00 MF$0.65

STUDIES OF MATERIAL WASTAGE RESULTING FROM REACTIONS OF WATER IN SODIUM,
Atomic Power Development Associates, Inc., Detroit, Mich.
H. V. Chamberlain, J. A. Cameron, J. H. Coleman, M. K. Deora, and J. A. Ford. Jun 70, 249p
Contract AT (11-1)-865

Descriptors: (*Boiler tubes, Degradation), Corrosion, Erosion, Sodium, Water, Leakage, Liquid metal cooled reactors.

For abstract, see NSA 24 20.
APDA-254 HC$3.00 MF$0.65

INTERMEDIATE HEAT EXCHANGER MODELING FOR FFTF SIMULATION,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
For primary bibliographic entry see Field 18I.
For abstract, see NSA 24 20.
BNWL-SA-2818 HC$3.00 MF$0.65

THE TRANSFER FUNCTION OF A HEAT EXCHANGER. COMPARISON OF DIFFERENT MODELS.
Die Ubertragungsfunktion des Waermetauschers Vergleich Der Verschiedenen Modelle
Osterreichische Studiengesellschaft Fur Atomenergie G.M.B.H., Seibersdorf (Austria). Inst. Fuer Reaktortechnik.
H. Schmidl. Apr 70, 24p SGAE-RT-32/1970
Lang- in German Subm- Submitted for Publication

Descriptors: *Dynamic models, *Heat transfer coefficients, *Tube heat exchangers, Functional analysis, Pipe flow, Transport properties, Turbulent heat transfer.

For abstract, see STAR 08 21.
N70-38578 HC$3.00 MF$0.65

THE SITING OF NUCLEAR REACTORS AS RELATED TO URBAN HEAT SUPPLY,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 18I.
For abstract, see NSA 24 20.
ORNL-HUD-11 HC$3.00 MF$0.65

COST-EFFECTIVENESS ANALYSIS OF ROADWAY LIGHTING SYSTEMS.
Research rept.,
Texas Transportation Inst., College Station.
W. F. McFarland, and N. E. Walton. Jun 69, 58p*
RR-137-1
Report on Roadway Illumination Systems. Sponsored in part by Texas Highway Dept. and Bureau of Public Roads, Washington, D.C.

Descriptors: (*Highway lighting, Cost effectiveness), (*Lighting equipment, Evaluation), Design criteria, Comparison, Motor vehicle accidents, Systems engineering, Substitutes, Costs, Factor analysis, Decision making, Statistical data, Texas.
Identifiers: Multilane highways.

The purpose of the report is to present the results of a cost-effectiveness study comparing alternative illumination configurations. Many illumination configurations were eliminated by considerations other than those discussed. Only five of the more interesting configurations are considered. The report is divided into several sections, including a discussion of effectiveness criteria and the five alternative considered, accident information used in comparing the five alternatives, costs of illumination units and on accidents involving motor vehicles and illumination units, and the cost-effectiveness analysis which is intended to show which illumination scheme is preferable for highways with different numbers of lanes. (BPR abstract)
PB-194 957 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT). THE BUS AND TRUCK SUPPLY COMPANY.
Electrical Testing Labs., Inc., New York.
For primary bibliographic entry see Field 13F.
PB-195 056 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT). TOYOTA MOTOR COMPANY, LTD.
Electrical Testing Labs., Inc., New York.
For primary bibliographic entry see Field 13F.
PB-195 072 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT). TOYOTA MOTOR COMPANY, LTD.
Electrical Testing Labs., Inc., New York.
For primary bibliographic entry see Field 13F.
PB-195 073 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT). GENERAL MOTORS CORPORATION.
Electrical Testing Labs., Inc., New York.
For primary bibliographic entry see Field 13F.
PB-195 074 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT). GENERAL MOTORS CORPORATION.
Electrical Testing Labs., Inc., New York.
For primary bibliographic entry see Field 13F.
PB-195 117 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT). GENERAL MOTORS CORPORATION.
Electrical Testing Labs., Inc., New York.
For primary bibliographic entry see Field 13F.
PB-195 118 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT). GENERAL MOTORS CORPORATION.
Electrical Testing Labs., Inc., New York.
For primary bibliographic entry see Field 13F.
PB-195 119 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT). GENERAL MOTORS CORPORATION.
Electrical Testing Labs., Inc., New York.
For primary bibliographic entry see Field 13F.
PB-195 120 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT) GENERAL MOTORS CORPORATION.
Electrical Testing Labs., New York.
For primary bibliographic entry see Field 13F.
PB-195 121 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT) GENERAL MOTORS CORPORATION.
Electrical Testing Labs., Inc., New York.
For primary bibliographic entry see Field 13F.
PB-195 122 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT) GENERAL MOTORS CORPORATION.
Electrical Testing Labs., Inc., New York.
For primary bibliographic entry see Field 13F.
PB-195 123 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT). GENERAL MOTORS CORPORATION.
Electrical Testing Labs., Inc., New York.
For primary bibliographic entry see Field 13F.
PB-195 124 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT). GENERAL MOTORS CORPORATION.
Electrical Testing Labs., Inc., New York.
For primary bibliographic entry see Field 13F.
PB-195 125 HC$3.00 MF$0.65

A STUDY OF COMFORT, HEALTH AND LEARNING IN SCHOOLS WITH DIFFERING THERMAL CONDITIONS.
Dunlap and Associates, Inc., Darien, Conn.
For primary bibliographic entry see Field 6N.
PB-195 257 HC$3.00 MF$0.65

13B. Civil Engineering

DENVER EARTHQUAKES,
Edgewood Arsenal Md
For primary bibliographic entry see Field 8K.
AD-713 526 HC$3.00 MF$0.65

A CONCEPT OF ROW CRATER ENHANCEMENT,
Army Engineer Nuclear Cratering Group Livermore Calif
For primary bibliographic entry see Field 18C.
AD-713 574 HC$3.00 MF$0.65

EROSION CONTROL ON AIR FORCE BASES.
Water Resources Engineers Inc Walnut Creek Calif
For primary bibliographic entry see Field 8M.
AD-713 644 HC$3.00 MF$0.65

ESTUARINE VERSION OF THE COLHEAT DIGITAL SIMULATION MODEL,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
For primary bibliographic entry see Field 8H.
For abstract, see NSA 24 20.
BNWL-1342 HC$3.00 MF$0.65

SYMPOSIUM ON ENGINEERING WITH NUCLEAR EXPLOSIVES, LAS VEGAS, NEVADA, JANUARY 14-16, 1970. PROCEEDINGS.
American Nuclear Society, Hinsdale, Ill.
For primary bibliographic entry see Field 18C.
For abstract, see NSA 24 20.
CONF-700101-(Vol.1) HC$10.00 MF$0.65

SYMPOSIUM ON ENGINEERING WITH NUCLEAR EXPLOSIVES, LAS VEGAS, NEVADA, JANUARY 14-16, 1970. PROCEEDINGS.
American Nuclear Society, Hinsdale, Ill.
For primary bibliographic entry see Field 18C.
For abstract, see NSA 24 20.
CONF-700101-(Vol.2) HC$10.00 MF$0.65

PARTICLE SIZE DISTRIBUTION OF CHLORINE AND BROMINE IN MID-CONTENT AEROSOLS FROM THE GREAT LAKES BASIN,
Michigan Univ., Ann Arbor. Dept. of Meteorology and Oceanography.
Ronald H. Loucks, and John W. Winchester. Aug 69, 181p
Contract AT (11-1)-1705

Descriptors: (*Chlorine, *Air pollution), (*Bromine, Air pollution), (*Atmospheric physics, *Halogens), (*Combustion products, Halogens), Aerosols, Cloud physics, Gasoline, Coal, Fuel oil, Sampling, Great Lakes.

For abstract, see NSA 24 20.
COO-1705-5 HC$3.00 MF$0.65

THE USE OF AN ACCELERATED WEAR MACHINE TO EXAMINE THE SKIDDING RESISTANCE OF CONCRETE SURFACES,
Road Research Lab., Crowthorne (England).
For primary bibliographic entry see Field 13C.
PB-194 856 HC$3.00 MF$0.65

THE INFLUENCE OF MATERIALS AND MIX DESIGN ON THE SKID RESISTANCE VALUE AND TEXTURE DEPTH OF CONCRETE,
Road Research Lab., Crowthorne (England).
For primary bibliographic entry see Field 13C.
PB-194 857 HC$3.00 MF$0.65

A REVIEW OF THE LOW-SPEED SKIDDING RESISTANCE OF A NUMBER OF CONCRETE ROADS CONTAINING VARIOUS AGGREGATES,
Road Research Lab., Crowthorne (England).
For primary bibliographic entry see Field 13C.
PB-194 858 HC$3.00 MF$0.65

CONTINUOUS AIR MONITORING PROJECTS: 1964 DATA TABULATIONS AND SUMMARIES. NATIONAL AIR SURVEILLANCE NETWORKS: CHICAGO, CINCINNATI, PHILADELPHIA, ST. LOUIS, WASHINGTON, D.C.
National Air Pollution Control Administration, Arlington, Va. Div. of Air Quality and Emission Data.
May 69, 455p APID-69-3

Descriptors: (*Air pollution, *Urban areas), (*District of Columbia, Air pollution), Monitors, Continuous sampling, Diurnal variations, Seasonal variations, Arithmetic mean, Concentration (Composition), Carbon monoxide, Hydrocarbons, Nitrogen dioxide, Nitrogen oxide (NO), Oxidizers, Sulfur dioxide, Aerosols, Tables (Data), Pennsylvania, Ohio, Missouri, Illinois.
Identifiers: Continuous air monitoring projects, Air pollution detection, Soiling index, *Chicago (Illinois), *Cincinnati (Ohio), *Philadelphia (Pennsylvania), *Saint Louis (Missouri).

For each of five major cities, summaries of hourly average concentrations of carbon monoxide, nitric oxide, nitrogen dioxide, sulfur dioxide, total hydrocarbons, total oxidants, and 2-hour measurements of soiling index are tabulated. The cities are: Chicago, Cincinnati, Philadelphia, St. Louis, and Washington, D.C. Brief summaries of monthly means and maximums, and annual frequency distributions of data from these cities are also tabulated. (Author)
PB-194 859 HC$3.00 MF$0.65

1965 DATA TABULATIONS AND SUMMARIES, CONTINUOUS AIR MONITORING PROJECTS, NATIONAL AIR SURVEILLANCE NETWORKS.
National Air Pollution Control Administration, Arlington, Va.

May 69, 523p APTD-69-5

Descriptors: (*Air pollution, *Urban areas), (*District of Columbia, Air pollution), Monitors, Continuous sampling, Diurnal variations, Seasonal variations, Carbon monoxide, Nitrogen dioxide, Nitrogen oxide (NO), Sulfur dioxide, Hydrocarbons, Oxidizers, Aerosols, Arithmetic mean, Illinois, Ohio, Colorado, Pennsylvania, Missouri, Tables (Data).
Identifiers: *Chicago (Illinois), *Cincinnati (Ohio), *Denver (Colorado), *Philadelphia (Pennsyl-

vania), *Saint Louis (Missouri), Air pollution detection, Continuous air monitoring projects, Soiling index.

For each of six major cities, summaries of hourly average concentrations of carbon monoxide, nitric oxide, nitrogen dioxide, sulfur dioxide, total hydrocarbon, and total oxidant are tabulated. The cities are Chicago, Cincinnati, Denver, Philadelphia, St. Louis, and Washington, D. C. Summaries of 2-hour measurements of soiling index are also tabulated for each city except Denver. Brief summaries of monthly means and maximums, and annual frequency distributions of data are also tabulated. (Author)
PB-194 860 HC$3.00 MF$0.65

1967 DATA TABULATIONS AND SUMMARIES, CONTINUOUS AIR MONITORING PROJECTS, NATIONAL AIR SURVEILLANCE NETWORKS, CINCINNATI.
National Air Pollution Control Administration, Arlington, Va.

Apr 69, 102p APTD-69-7

Descriptors: (*Air pollution, *Urban areas), Ohio, Monitors, Continuous sampling, Diurnal variations, Seasonal variations, Carbon monoxide, Nitrogen dioxide, Nitrogen oxide (NO), Sulfur dioxide, Hydrocarbons, Oxidizers, Aerosols, Arithmetic mean, Tables (Data).
Identifiers: *Cincinnati (Ohio), Air pollution detection, Continuous air monitoring projects, Soiling index.

Hourly average concentrations of six gaseous pollutants (carbon monoxide, nitric oxide, nitrogen dioxide, sulfur dioxide, total hydrocarbons, and total oxidants), and 2-hour measurements of soiling index are tabulated for Cincinnati, Ohio. A brief summary of monthly means and maximums and graphs of seasonal diurnal patterns of gaseous pollutants are also included. Annual frequency distributions of the data pertaining to gases and soiling index for Cincinnati and also for Chicago, Denver, Philadelphia, St. Louis, and Washington, D. C. are tabulated. (Author)
PB-194 861 HC$3.00 MF$0.65

CONTINUOUS AIR MONITORING PROJECTS: 1967 DATA TABULATIONS AND SUMMARIES, WASHINGTON, D. C.
National Air Pollution Control Administration, Arlington, Va. Div. of Air Quality and Emission Data.

Apr 69, 103p APTD-69-11

Descriptors: (*Air pollution, *Urban areas), (*District of Columbia, Air pollution), Monitors, Continuous sampling, Diurnal variations, Seasonal variations, Arithmetic mean, Concentration (Composition), Carbon monoxide, Hydrocarbons, Nitrogen dioxide, Nitrogen oxide (NO), Oxidizers, Sulfur dioxide, Aerosols, Tables (Data).
Identifiers: Continuous air monitoring projects, Air pollution detection, Soiling index.

Hourly average concentrations of five gaseous pollutants (carbon monoxide, nitric oxide, nitrogen dioxide, sulfur dioxide, and total oxidants) and 2-hour measurements of soiling index levels for Washington, D. C. are included. A brief summary of monthly means and maximums and graphs of seasonal diurnal patterns of gaseous pollutants is also included. Annual frequency distributions of the data pertaining to gases and soiling index for Washington, D.C. and for Chicago, Cincinnati, Denver, Philadelphia, and St. Louis are tabulated. (Author)
PB-194 862 HC$3.00 MF$0.65

CONTINUOUS AIR MONITORING PROJECTS IN PHILADELPHIA 1962 - 1965.
National Air Pollution Control Administration, Cincinnati, Ohio. Div. of Air Quality and Emission Data.

Aug 69, 356p APTD-69-14

Descriptors: (*Air pollution, *Urban areas), Pennsylvania, Monitors, Continuous sampling, Diurnal variations, Seasonal variations, Arithmetic mean, Concentration (Composition), Carbon monoxide, Hydrocarbons, Nitrogen dioxide, Nitrogen oxide (NO), Oxidizers, Sulfur dioxide, Aerosols, Tables (Data), Particles.
Identifiers: Continuous air monitoring projects, *Philadelphia (Pennsylvania), Air pollution detection, Soiling index.

Data on the atmospheric levels of carbon monoxide, nitric oxide, nitrogen dioxide, sulfur dioxide, total hydrocarbons, and total oxidants and on soiling index are analyzed and discussed for Philadelphia, Pennsylvania. To facilitate the use of the volume as a reference, the data are tabulated as hourly, daily, and monthly mean concentrations. Background information about Philadelphia and a description of the instrumentation used are included. (Author)
PB-194 863 HC$3.00 MF$0.65

ANNOTATED LIST OF PUBLICATIONS 1895 - 1970,
Illinois State Water Survey, Urbana.
J. Loreena Ivens. 1970, 87p

Descriptors: (*Water resources, *Illinois), Bibliographies, Ground water, Surface waters, Water conservation, Water consumption, Water quality, Water supply, Climatology, Hydrology, Hydraulic equipment, Abstracts.

The State Water Survey issues three formal series of publications: Bulletins, Reports of Investigation, and Circulars. A Miscellaneous Publications category includes technical letters and other briefed materials, as well as brochures. Other Water Survey studies are disseminated through reports prepared for granting or contracting agencies or through reprints from scientific journals and periodicals. In this booklet publications in each series and groups are listed and briefly described. Study of the varied aspects of water resources is conducted at the Water Survey under five technical sections: chemistry, hydrology, hydraulic systems, water quality, and atmospheric sciences.
PB-194 864 HC$3.00 MF$0.65

SOLID WASTE COLLECTION AND DISPOSAL PROGRAM.
South Alabama Regional Planning Commission, Mobile.
Sep 70, 225p

Descriptors: (*Waste disposal, *Alabama), (*Regional planning, Waste disposal), Refuse disposal, Earth fills, Incinerators, Composts, Metals, Industrial wastes.
Identifiers: Sanitary landfills, Open dumps, *Solid waste disposal, Composting, *Baldwin County (Alabama), *Escambia County (Alabama), *Mobile County (Alabama), Junk automobiles, Scrap metal.

The regional solid waste collection and disposal study comprises an inventory and evaluation of the existing solid waste collection and disposal system operation in Mobile, Baldwin and Escambia Counties, Alabama. The general sections describes the characteristics of refuse generated in the three-county region and factors influencing quantities. It describes the existing methods of refuse disposal and the role of packaging relative to the solid waste problem. (Author)
PB-194 865 HC$3.00 MF$0.65

LAKE COUNTY GENERAL PLAN. TRANSPORTATION ELEMENT.
Lake County Planning Commission, Calif.

Oct 69, 66p
Prepared in cooperation with Hahn, Wise and Associates, Inc. San Carlos, Calif.

Descriptors: (*Regional planning, *California), (*Airports, Regional planning), Populations, Income, Commerce, Air traffic, Land use, Financial management.
Identifiers: *Lake County (California).

Contents: Background for the Lake County Airport Plan; Current situation; Projections; Population and income; Industry, commerce and tourism; Estimates of future based aircraft and volume of air traffic; Estimated type of air traffic; Capacity; The Airport Plan; Goals and objectives; Principles and standards; The transportation plan; Height and land use regulations for airports; Finance.
PB-194 868 HC$3.00 MF$0.65

MODEL TEST RESULTS OF CIRCULAR, SQUARE, AND RECTANGULAR FORMS OF DROP-INLET ENTRANCE TO CLOSED-CONDUIT SPILLWAYS.
Rept of Investigation,
Illinois State Water Survey, Urbana.
Harold W. Humphreys, Gunnar Sigurdsson, and H. James Owen. 1970, 75p RI-65

Descriptors: (*Spillways, Drop inlets), (*Drop inlets, Model tests), Pipes (Tubes), Rectangular bodies, Squares (Geometry), Vortices, Hydraulics.

Laboratory research studies were performed to develop closed-conduit spillways that have single-valued characteristics and to develop criteria for predicting the minumum hydraulic performance of drop-inlet spillways when vortex formation at the inlet is not controlled. This report presents the results of model tests on circular, square, and rectangular forms of a drop-inlet entrance to a closed-conduit spillway. When the formation of vortices at the entrance to a drop-inlet spillway is not controlled, the vortex can be erratic and its occurrence unpredictable. The vortex can be so strong that it seriously affects the spillway performance and reduces the spillway capacity, or the vortex can be so weak it has no effect on the spillway performance or capacity. Although the occurrence of the vortex is unpredictable, a method is presented that can be used to determine when a drop-inlet spillway requires an antivortex device for satisfactory hydraulic performance. Also, a method is presented for determining the minimum performance of a drop-inlet spillway when the vortex formation is uncontrolled. A horizontal circular plate positioned above the drop-inlet crest of a circular drop-inlet spillway is shown to be an effective antivortex device. Also, a properly positioned plate can significantly reduce the head necessary for the spillway to prime and flow full of water when compared with the priming head at the intersection of the usual weir- and full-flow curves. (Author)
PB-194 869 HC$3.00 MF$0.65

DISSOLVED OXYGEN RESOURCES AND WASTE ASSIMILATIVE CAPACITY OF THE LA GRANGE POOL, ILLINOIS RIVER.
Rept. of Investigation,
Illinois State Water Survey, Urbana.
T. A. Butts, D. H. Schnepper, and R. L. Evans. 1970, 32p RI-64

Descriptors: (*Rivers, *Dissolved gases), (*Biochemical oxygen demand, Rivers), (*Water pollution, Rivers), Oxygen, Sewage, Industrial wastes, Nutrients, Temperature, Water quality, Stream flow, Monitors, Illinois.
Identifiers: *Illinois River, *Water pollution control.

A study of the dissolved oxygen resources of the La Grange navigation pool in the Illinois River during 1965--1967 provides concepts which can be of assistance to regulatory agencies responsible for making decisions for water quality management. Dissolved oxygen water quality standards for the La Grange pool require the maintenance of 5 milligrams per liter (mg/l) or more during at least 16 hours of any 24-hour period and not less than 4 mg/l at anytime. Conditions in the pool were observed to fall consistently below these standards. Weighted average pool dissolved oxygen concentrations were found to be as low as 1.65 mg/l, with a minimum of 0.9 mg/l. Three objectives were established: (1) to relate observed dissolved oxygen concentrations to flow, temperature, and oxygen demand; (2) to develop a waste assimilative capacity model; and (3) to develop a statistical water quality control chart to aid in the interpretation of data generated by continuous monitoring. The report describes the methodologies tried and selected to achieve these objectives. Statistical regression methods were used to develop relationships for achieving the first objective. Mathematical models were formulated permitting the prediction of average and minimum dissolved oxygen concentrations in the pool waters. The Black and Phelps method with Velz's modification was found to be the most appropriate approach for defining the waste assimilative capacity of the pool. To meet the third objective a one-sided quality control chart was designed to detect trends deviating from an expected pattern. (Author)
PB-194 873 HC$3.00 MF$0.65

SOUTH ALABAMA REGIONAL AIR POLLUTION STUDY, 1970. STUDY OF THE AMBIENT AIR QUALITY, AND POLLUTION POTENTIAL OF BALDWIN, ESCAMBIA AND MOBILE COUNTIES,
South Alabama Regional Planning Commission, Mobile.
James Fibbe. Apr 70, 53p
Errata sheet inserted.

Descriptors: (*Air pollution, *Regional planning), (*Alabama, Air pollution), Law (Jurisprudence), Urban areas, Monitors, Exhaust gases, Incinerators, Combustion products, Particles, Atmospheric circulation.
Identifiers: Solid waste disposal, Air pollution detection, *Mobile (Alabama), *Baldwin County (Alabama), *Escambia County (Alabama), *Mobile County (Alabama).

The report is a study of present quality of the air over the counties of Baldwin, Escambia, and Mobile, Alabama. The report considers the general factors and effects of air pollution. It further provides information on the levels of pollution and the probable sources. The present laws and the needs for future changes in the law are discussed. Conclusions regarding the total air pollution picture are drawn and recommendations for future action are provided. (Author)
PB-194 874 HC$3.00 MF$0.65

THE IMPLICATIONS OF LEAD REMOVAL FROM AUTOMOTIVE FUEL.
Interim rept.
Dept. of Commerce, Washington, D.C. Panel on Automotive Fuels and Air Pollution.

Jun 70, 36p*

Descriptors: (*Air pollution, *Exhaust gases), (*Spark ignition engines, Air pollution), (*Antiknock additives, *Lead organic compounds), (*Government policies, *Automotive fuels), Recommendations, Fuel additives, Antiknock ratings, Octane number, Air pollution control equipment, Exhaust systems, Catalysts, Petroleum industry, Cost estimates.
Identifiers: Automobile exhaust.

The report of the Panel on Automotive Fuels and Air Pollution deals with the effects of lead-containing fuel additives on emissions from gasoline-piston engines. The final report will deal more fully with the question of fuel composition as called for by the Charter. The contents include brief discussions on the following topics: Summary (The implications of lead removal from automotive fuel, Timing, Low-lead fuel, Price incentives, Public notification of octane increases, Inspection programs); Introduction and background of panel study; The implications of lead removal from automotive fuels (Benefits of lead, Benefits of lead removal, Effects of lead reduction, Emission control technology, Thermal exhaust-gas reactors (EGR), Exhaust gas recirculation systems, Catalytic devices, Summary of status of emission control devices, Fuel requirements, Status of petroleum refineries, Construction of new capacity, Cost of lead reduction); and Conclusions and recommendations.
PB-194 880 HC$3.00 MF$0.65

KANAWHA VALLEY AIR POLLUTION STUDY.
National Air Pollution Control Administration, Raleigh, N.C.

Mar 70, 371p APTD-70-1
Prepared in cooperation with West Virginia Air Pollution Control Commission. Errata sheet inserted.

Descriptors: (*Air pollution, *Regional planning), (*West Virginia, Air pollution), Environmental surveys, Valleys, Meteorological data, Odors, Plants (Botany), Atmospheric corrosion, Economics, Particles, Combustion products, Exhaust gases, Industrial wastes, Electric power plants, Monitors, Incinerators, Atmospheric circulation.
Identifiers: Kanawha Valley, Kanawha County (West Virginia), Air pollution detection, Plant damage, Air pollution control equipment.

The aim was to collect and assemble data and information as a basis for technical and official action needed to attain and conserve a desirable air quality in Kanawha Valley, West Virginia. The joint study was conducted from August 1964 through December 1966 and included: (1) measurement of air quality; (2) measurement and description of meteorological parameters; (3) odor studies; (4) collection and evaluation of existing information; (5) pollutant emission inventory; (6) study of materials deterioration; (7) study of means and economics of pollution control; and (8) special studies on vegetation, health, public attitudes, and pollutants not routinely measured. The results of the first seven activities are included. Preliminary results of the studies in vegetation, health and attitudes were considered in developing the Air Resource Management Program. (Author)
PB-194 881 HC$3.00 MF$0.65

NEIGHBORHOOD ANALYSIS: MEBANE, NORTH CAROLINA.
North Carolina State Dept. of Local Affairs, Raleigh. Div. of Community Planning.
George C. Goodman. Jan 70, 55p
Prepared in cooperation with Mebane Planning Board, N.C. Paper copy also available from North Carolina Dept. of Local Affairs, Division of Community Planning, P.O. Box 1991, Raleigh, N.C. 27602. $2.00.

Descriptors: (*Urban planning, *North Carolina), (*Neighborhoods, Urban planning), Blighted areas, Residential buildings, Economic factors, Public health.
Identifiers: *Mebane (North Carolina), Juvenile delinquency.

The study examines the nature, extent and causes of blight on a neighborhood by neighborhood basis. It suggests a plan of action on a neighborhood basis designed to make each an asset to the community and to the residents who live and work there. (Author)
PB-194 883 HC$3.00 MF$0.65

IN-SERVICE EXPERIENCE ON INSTALLATION OF TEXAS MODULAR CRASH CUSHIONS.
Texas Transportation Inst., College Station.
For primary bibliographic entry see Field 13L.
PB-194 884 HC$3.00 MF$0.65

HOUSING ELEMENT, CHERRYVILLE, NORTH CAROLINA.
North Carolina State Dept. of Local Affairs, Salisbury. Div. of Community Planning.

Sep 70, 14p

Descriptors: (*Urban planning, *North Carolina), (*Residential buildings, Urban planning), Blighted areas, Economic factors, Project planning.
Identifiers: *Cherryville (North Carolina).

This element has four principal components relative to housing in the Cherryville planning area: statement of problems; statement of obstacles; statement of annual objectives and implementing actions. The Housing Element appraises the problems and obstacles to obtaining standard housing throughout the planning area. In view of the findings, specific proposals are offered to rectify current problems and develop a workable implementing program. (Author)
PB-194 889 HC$3.00 MF$0.65

TRENDS OF PAVEMENT CHARACTERISTICS DURING TWELVE MONTHS OF A DESIGNED EXPERIMENT.
State study no. 903, Year 2,
Utah State Dept. of Highways.
Michael I. Darter, James S. Lai, and Roland Vokac. Aug 70, 48p*
Also includes State study no. 910, Year 2. Errata sheet inserted. Prepared in cooperation with Bureau of Public Roads, Washington, D.C.

Descriptors: (*Flexible pavements, Evaluation), (*Highways, *Utah), (*Elastomers, Flexible pavements), Asphalts, Diene resins, Bituminous cements, Binders (Materials), Kinematic viscosity, Performance, Thickness, Time, Hardening (Materials), Trends, Mixtures.

The document reports on a research project to analyze by means of a statistically designed experiment, the behavior and performance of bituminous pavements in which different viscosity type asphalts have been modified with varying amounts rubber solids and incorporated into bituminous mixes in amounts above and below the designed percentage and placed in different thickness on various depths of granular base. The paper presents some of the significant findings observed during the first twelve month period of a comprehensive two year field and laboratory project. (Author)
PB-194 892 HC$3.00 MF$0.65

SENSITIVITY ANALYSIS OF THE EVALUATION OF A BUS TRANSIT SYSTEM IN A SELECTED URBAN AREA.
Peat, Marwick, Livingston and Co., Washington, D.C.
May 70, 76p
Contract FH-11-6678
Errata sheet inserted. Supersedes PB-187 665.

Descriptors: (*Urban areas, Bus lines), (*Bus lines, Evaluation), Public opinion, Parking facilities, Terminal facilities, Transportation, Urban planning.
Identifiers: *Bus fares, Minibus lines.

The report is a followup of the original report, the study considers: (1) the effect on transit patronage of various policy modifications, such as changes in bus fares and parking rates; (2) how different components of transit service and design contribute to the attractiveness of bus transit; (3) the different effects of congested and uncongested roadway facilities on transit patronage; and (4) the effec-

tiveness of providing public transportation service to an entire metropolitan area through a fine-grained, ubiquitous bus transit network, including exclusive busways, a downtown terminal, and a pedestrian distribution system. (BPR abstract)
PB-194 893 HC$3.00 MF$0.65

CHICAGO AREA EXPRESSWAY SURVEILLANCE PROJECT ON THE DEVELOPMENT OF A FREEWAY DRIVER INFORMATION SYSTEM.
Illinois State Div. of Highways.
For primary bibliographic entry see Field 5B.
PB-194 894 HC$3.00 MF$0.65

CHICAGO AREA EXPRESSWAY SURVEILLANCE PROJECT. A COMPARISON BETWEEN SELECTED TRAFFIC INFORMATION DEVICES.
Research and development rept.,
Illinois State Div. of Highways.
Gerald C. Hoff. Oct 69, 67p 22
Prepared in cooperation with Bureau of Public Roads, Washington, D.C.

Descriptors: (*Limited access highways, *Traffic control), Traffic surveys, Traffic signals, Maps, Radio communication, Interviews.
Identifiers: *Traffic information devices.

The report presents - the results of a study that was conducted to determine what traffic information techniques might be used to cause drivers to divert around congested parts of the highway system. The results of the study indicate that drivers prefer visual techniques to vocal techniques. Of the different devices tested a changeable message matrix sign was the most preferred. However, no conclusive evidence could be found that would indicate that this type of device would cause more drivers to divert around a congested section of highway than the other type of devices tested. (BPR abstract)
PB-194 896 HC$3.00 MF$0.65

TIME - DEPENDENT DEFORMATION CHARACTERISTICS OF COMPACTED COHESIVE SOILS.
Purdue Univ., Lafayette, Ind. Joint Highway Research Project.
For primary bibliographic entry see Field 8M.
PB-194 897 HC$3.00 MF$0.65

EVALUATION AND PREDICTION OF THE TENSILE PROPERTIES OF LIME-TREATED MATERIALS.
Research rept.,
Texas Univ., Austin. Center for Highway Research.
Walter S. Tulloch, II, W. Ronald Hudson, and Thomas W. Kennedy. Jun 70, 118p RR-98-5
Prepared in cooperation with Bureau of Public Roads, Washington, D.C.

Descriptors: (*Soil stabilization, Calcium hydroxide), (*Clays, Roadbeds), (*Highways, Texas), Tensile strength, Compacting, Moisture content, Pavement bases, Cohesion, Evaluation, Regression analysis, Test equipment, Correlations, Test specimens.
Identifiers: Lime treated clay.

The paper describes four statistically designed experiments on a lime-treated plastic clay. The first experiment evaluated the effect of lime content, clay content, molding water, compactive effort and curing temperature on the indirect tensile strength, vertical failure deformation and horizontal failure deformation. The second and third experiments were designed to correlate indirect tensile strength with the unconfined compressive strength and cohesiometer value. The only difference was in the curing procedure. The fourth experiment considered specimen size as related to measured indirect-tensile strength of the lime-treated clay. (BPR abstract)
PB-194 899 HC$3.00 MF$0.65

GREENVILLE COUNTY PUBLIC UTILITIES.
Greenville County Planning Commission, S. C.

Sep 70, 56p SC-40-0014-0203

Descriptors: (*Regional planning, *South Carolina), (*Public utilities, Regional planning), Drainage, Water resources, Sewers, Electric utilities, Telephone systems, Natural gas.
Identifiers: *Greeenville County (South Carolina).

The study constitutes the public utility element of the Community Facilities Plan and Program for Greenville County. Its purpose is to determine the adequacy of public utilities with the county. The study inventories existing public utilities--water, sewer, storm drainage, natural gas, electrical power, and telephone service. (Author)
PB-194 903 HC$3.00 MF$0.65

ZONING ORDINANCE OF THE CITY OF MYRTLE BEACH.
South Carolina State Planning and Grants Div., Columbia.

Sep 70, 30p SC-40-0014-0231

Descriptors: (*Urban planning, *South Carolina), (*Land use zoning, Urban planning), Ordinances, Regulations, Urban areas.
Identifiers: *Myrtle Beach (South Carolina).

For the purpose of controlling the use and development of land in accordance with the comprehensive plan, the City of Myrtle Beach has been subdivided into accommodations, commercial, industrial, and transitional districts. Appropriate land use regulations are set forth for each district. (Author)
PB-194 904 HC$3.00 MF$0.65

LAND USE SURVEY AND ANALYSIS AND LAND DEVELOPMENT PLAN REVISION: FRANKLIN, NORTH CAROLINA.
North Carolina State Dept. of Local Affairs, Asheville. Div. of Community Planning.
Alvin F. Midgette. Aug 70, 66p
Sponsored in part by North Carolina State Dept. of Local Affairs, Raleigh. Div. of Community Planning. Prepared in cooperation with Franklin Planning Board, N.C. Paper copy also available from North Carolina State Dept. of Local Affairs, Western Area Office, Asheville. Div. of Community Planning, Northwestern Bank Bldg., Asheville, N.C. $2.00.

Descriptors: (*Urban planning, *North Carolina), (*Land use, Urban planning), Topographic surveys, Land development, Recreational facilities, Maps.
Identifiers: *Franklin (North Carolina).

The location, extent and condition of existing land uses within the town and its one-mile perimeter area are described and analyzed. Their contribution to the community individually and collectively is determined. (Author)
PB-194 907 HC$3.00 MF$0.65

THE USE OF DIAGRAMS IN HIGHWAY ROUTE LOCATION: AN EXPERIMENT.
Research rept.,
Massachusetts Inst. of Tech., Cambridge. Civil Engineering Systems Lab.
Christopher Alexander, and Marvin L. Manheim. Mar 62, 116p R62-3, Pub-161
Prepared in cooperation with Harvard Univ., Cambridge, Mass.

Descriptors: (*Highways, Routing), (*Route surveys, Diagrams), Mathematical analysis, Maps, Massachusetts.

The problem of determining the location of Rout I-91 was undertaken as a demonstration project, to illustrate certain aspects of a new approach to physical design problems. The paper outlines, step by step, the nature of the problem, the process, and the reasons for adopting a process of this kind in solving the problem.
PB-194 908 HC$3.00 MF$0.65

PREDICTION OF MOISTURE MOVEMENT IN EXPANSIVE CLAYS.
Texas Univ., Austin. Center for Highway Research.
For primary bibliographic entry see Field 8H.
PB-194 910 HC$3.00 MF$0.65

STRUCTURAL AND ENVIRONMENTAL CONDITION SURVEY, AND ENVIRONMENTAL IMPROVEMENTS WORKLOADS,
Department of Metropolitan Development, Indianapolis. Div. of Planning and Zoning.
Sep 70, 186p

Descriptors: (*Environmental surveys, Urban renewal), (*Regional planning, *Indiana), Methodology, Statistical data, Organizations, Economic conditions, Buildings, Manuals, Demography.
Identifiers: *Indianapolis (Indiana), *Marion County (Indiana).

The report describes methodology and lists data regarding the structural and environmental survey of Indianapolis and Marion County. Additionally survey data combined with other factors are used in the selection of potential renewal treatment areas, and the compilation of environmental improvement workloads for these areas. (Author)
PB-194 931 HC$3.00 MF$0.65

USE OF A RUMBLE STRIPE TO REDUCE MAINTENANCE AND INCREASE DRIVING SAFETY.
Final rept. on State study no. 901,
Utah State Dept. of Highways. Materials and Tests Div.
Roger L. Cahoon. 1969, 65p*
Errata sheet inserted.

Descriptors: (*Highways, Grooving), (*Vehicular traffic control, Markers), Points, Sound generators, Visibility, Concrete pavements, Snow removal, Maintenance, Feasibility, Effectiveness, Test methods, Utah.
Identifiers: *Highway rumble stripes, Rumble stripes.

A rumble stripe is a textured highway paint stripe produced by cutting grooves in the road surface prior to painting. Its purpose is to improve paint life and visibility and also to produce a rumbling noise when run over by a vehicle tire. The noise should keep the driver from wandering over the lane line. Various grooves and textures were cut in concrete surfaces with diamond cutters and later striped with paint. It was found that water drains from the grooves and makes the visibility on a wet night markedly improved. Paint life is extended because of the paint being recessed from the surface. (Author)
PB-194 933 HC$3.00 MF$0.65

PROGRAM DESIGN AND COMPLETION REPORT FOR THE DEVELOPMENT OF A COMPREHENSIVE POLICIES PLAN FOR THE STATE OF OKLAHOMA.
Wise (Harold F.) and Associates, Washington, D.C.

Dec 69, 197p
Prepared in cooperation with Oklahoma Industrial Development and Park Planning, Oklahoma City. Div. of Research and Planning.

Descriptors: (*Regional planning, *Oklahoma), Education, Public health, Law enforcement, Criminal investigations, Economic factors, Transportation, Residential buildings.

The study design was prepared as a step toward the establishment and maintenance of a continuing comprehensive planning process in the State of Oklahoma. The report was designed to examine the existing planning process, to suggest the means for improving that process, and to make recommendations concerning planning in various functional areas. The first section deals with the need for comprehensive planning and the steps that are involved in the process. The second section recommends the structures that will be necessary to improve planning at the State, regional, and local levels, as well as in functional areas. The major part of the report is the Action Program, which makes specific recommendations for meeting the needs of the State planning process in various areas of governmental activity. (HUD abstract)
PB-194 936 HC$3.00 MF$0.65

CONVERSION OF MUNICIPAL AND INDUSTRIAL REFUSE INTO USEFUL MATERIALS BY PYROLYSIS.
Rept. of investigations,
Bureau of Mines, Washington, D.C.
W. S. Sanner, C. Ortuglio, J. G. Walters, and D. E. Wolfson. Aug 70, 18p* RI-7428

Descriptors: (*Waste disposal, *Destructive distillation), (*Refuse disposal, *Pyrolysis), (*Ammonium sulfate, Production), (*Manufactured gas, Destructive distillation), Tars, Industrial wastes, Garbage disposal, Sewage disposal, Hydrogen, Hydrocarbons, Carbon monoxide.
Identifiers: *Solid waste disposal.

Pyrolysis (destructive distillation) techniques developed at the Bureau of Mines to determine the yield and quality of the products from coal were used to convert municipal (household) and industrial refuse into potentially useful solids, liquids, and gases without adding to environment pollution. The tests demonstrated that a ton municipal refuse can be converted into 154 to 424 pounds of solid residue, 0.5 to 6 gallons of tar, 1 to 4 gallons of light oil, 97 to 133 gallons of liquor, 16 to 32 pounds of ammonium sulfate, and 7,380 to 18,058 cubic feet of gas. A ton of industrial refuse, consisting of paper, rags, and cardboard, can be converted to 618 to 838 pounds of residue, 1.5 to 3 gallons of light oil, 68 to 75 gallons of liquor, 12 to 23 pounds of ammonium sulfate, and 9,270 to 14,065 cubic feet of gas. The energy from the gas is more than sufficient to provide the heat for the pyrolysis. (Author)
PB-194 946 HC$3.00 MF$0.65

RECOVERY OF METALS FROM ELECTROPLATING WASTES BY THE WASTE-PLUS-WASTE METHOD.
Bureau of Mines, Washington, D.C.
For primary bibliographic entry see Field 7A.
PB-194 948 HC$3.00 MF$0.65

DEVELOPMENT OF INFORMATION REQUIREMENTS AND TRANSMISSION TECHNIQUES FOR HIGHWAY USERS.
Texas Transportation Inst., College Station.
For primary bibliographic entry see Field 5E.
PB-194 954 HC$3.00 MF$0.65

ANNOTATED BIBLIOGRAPHY AND SUMMARY OF RESEARCH NEEDS IN THE HUMAN FACTORS ASPECTS OF DRIVER VISUAL COMMUNICATIONS.
Texas Transportation Inst., College Station.
For primary bibliographic entry see Field 5E.
PB-194 955 HC$3.00 MF$0.65

COST-EFFECTIVENESS ANALYSIS OF ROADWAY LIGHTING SYSTEMS.
Texas Transportation Inst., College Station.
For primary bibliographic entry see Field 13A.
PB-194 957 HC$3.00 MF$0.65

LAND DEVELOPMENT PLAN, YORK, SOUTH CAROLINA.
York Planning Commission, S.C.

Aug 70, 93p SC-40-0014-0169
Prepared in cooperation with Lyles, Bissett, Carlisle and Wolff, Columbia, S.C. Sponsored in part by South Carolina State Development Board, Columbia. Div. of Community Planning.

Descriptors: (*Urban planning, *South Carolina), (*Land use, Urban planning), Land development, Transportation, Public utilities, Hospitals, Recreational facilities.
Identifiers: *York (South Carolina).

The report contains a description of the major determinants of land use and recommendations for the future use of land in the York Planning Area; a description of public services and facilities in the city; a preliminary thoroughfare plan; and other methods for putting plans into effect. (Author)
PB-194 962 HC$3.00 MF$0.65

METHODS OF TEXTURING NEW CONCRETE ROAD SURFACES TO PROVIDE ADEQUATE SKIDDING RESISTANCE.
Road Research Lab., Crowthorne (England).
For primary bibliographic entry see Field 13C.
PB-194 965 HC$3.00 MF$0.65

BRIEF DESCRIPTIONS OF AND EXAMPLES OF OUTPUT FROM COMPUTER PROGRAMS DEVELOPED FOR USE WITH WATER DATA IN KANSAS.
Kansas Geological Survey, Lawrence.
Brent H. Lowell, Charles O. Morgan, and Jesse M. McNellis. 1970, 61p SP-48
Prepared in cooperation with the Environmental Health Services, Kansas State Dept. of Health, and Kansas State Board of Agriculture. Div. of Water Resources.

Descriptors: (*Water supplies, *Kansas), (*Hydrology, Statistical data), (*Data processing systems, Digital computers), Geologic survey, Computer programs, Water wells, Mathematical logic, Coding, Errors, Punched cards, Subroutines, Sedimentation, Chemical analysis, Quality control, Irrigation systems, Ions, Statistical distributions, Fluid flow.
Identifiers: *Computer graphics, Fortran 4 programming language.

Programs written in FORTRAN 4 language have been developed in the Kansas district of the U.S. geological survey to handle basic water data by use of the digital computer. The programs check, tabulate, graph, map, and statistically analyze data derived from hydrologic and geologic investigations. (Author)
PB-194 969 HC$3.00 MF$0.65

SIGNIFICANT POINTS FROM THE DIAGNOSTIC FIELD STUDIES: SUMMARY REPORT.
Texas Transportation Inst., College Station.
For primary bibliographic entry see Field 5E.
PB-194 983 HC$3.00 MF$0.65

TOPEKA AREA PLANNING STUDY: COMMUNITY FACILITIES AND OPEN SPACE.
Topeka-Shawnee County Regional Planning Commission, Kans.

Jul 70, 82p
Prepared in cooperation with Johnson, Brickell, and Mulcahy, Kansas City, Mo.

Descriptors: (*Urban planning, *Kansas), Land use, Public land, Schools, Libraries, Police, Public health, Recreational facilities, Airports.
Identifiers: *Topeka (Kansas).

Existing community facilities (schools, libraries, health facilities, police and fire stations, airports, and public buildings) were inventoried to determine location, size, and equipment available at each. Open spaces were also inventoried to determine location, type, and equipment available. Six types of open spaces were identified: regional park, community park, neighborhood recreation area, children's play area, parkway, and green area. (Author)
PB-195 005 HC$3.00 MF$0.65

TOPEKA AREA PLANNING STUDY: INITIAL HOUSING ELEMENT.
Topeka-Shawnee County Regional Planning Commission, Kans.

Jul 70, 121p

Descriptors: (*Urban planning, *Kansas), (*Residential buildings, Urban planning), Neighborhoods, Blighted areas, Community development, Project planning.
Identifiers: *Topeka (Kansas), Low income housing.

The Initial Housing Element contains statements of problems, obstacles, objectives, planning activities, and implementing actions as pertaining to housing in the Topeka Metropolitan Area. (Author)
PB-195 006 HC$3.00 MF$0.65

A COMPREHENSIVE PLAN FOR BOND COUNTY, ILLINOIS.
Bond County Planning Commission, Greenville, Ill.

May 70, 190p
Prepared in cooperation with Central States Planners, Inc., Carbondale, Ill.

Descriptors: (*Regional planning, *Illinois), Natural resources, Culture (Social sciences), Economic factors, Residential buildings, Land use, Transportation, Schools, Sanitary engineering.
Identifiers: *Bond County (Illinois).

Contents: Natural and cultural resources; Population; Economic base; Housing; Land use; Transportation; Community facilities, and Public improvements program. (Author)
PB-195 007 HC$3.00 MF$0.65

CENTRAL NEW YORK REGION WATER RESOURCES: DATA INVENTORY AND EVALUATION.
Technical memo.
Central New York Regional Planning and Development Board, Syracuse.

Jan 70, 16p TM-3
Prepared in cooperation with the New York State Office of Planning Coordination. Supported in part by the State of New York.

Descriptors: (*Regional planning, *New York), (*Water resources, Regional planning), Land use, Project planning, Documents.

The report describes the planning efforts, with respect to water resources and related land use of the Central New York Regional Planning and Development Board to January, 1970. Included in the memorandum are a water resources data inventory and an evaluation of the data available. The evaluation section details the organization for water resources planning, the Program for Cooperative Study employed by the River Basin Boards, the progress of this program, and liaison and coordination efforts which are or should be pursued by water resources planners and the Re-

gional Planning Board for their mutual benefit. (Author)
PB-195 008 HC$3.00 MF$0.65

CENTRAL NEW YORK REGION TOPOGRAPHY.
Inventory rept.
Central New York Regional Planning and Development Board, Syracuse.
Nov 69, 26p Inventory-3-Pt-1
Prepared in cooperation with the New York State Office of Planning Coordination. Supported in part by the State of New York.

Descriptors: (*Regional planning, *New York), (*Topographic surveys, New York), Urban areas, Rural areas, Land use.

The report describes the Region's surface characteristics, and their implications for Regional development. The Region is broken down into three topographic divisions: the Tug Hill Plateau, the Lake Ontario Plain, and the Appalachian Upland. Each of these areas is analyzed in terms of its general slope, local relief, unusual topographical features, and suitability for differing types of development. (Author)
PB-195 009 HC$3.00 MF$0.65

CENTRAL NEW YORK REGION INTERGOVERNMENTAL COORDINATION.
Inventory memo.
Central New York Regional Planning and Development Board, Syracuse.
Mar 70, 19p Inventory M-6
Prepared in cooperation with the New York State Office of Planning Coordination. Supported in part by the State of New York.

Descriptors: (*Regional planning, *New York), (*Local government, Regional planning), State government, Project planning.

Intergovernmental coordination, as an active pursuit of the Central New York Regional Planning and Development Board, is discussed in light of the Board's organization, its relation to other organizations in the Region, and the Board's programs and liaison efforts, both formal and informal. The RPDB is a five county organization and is primarily responsible for the coordination of plans, programs, and projects developed by County and lower governmental levels, within the Region, with Regional goals, objectives, and plans. The Regional approach fits into the State-wide coordination effort by means of its link with the New York State Office of Planning Coordination, and into the Federal effort by means of participation in Federal programs. (Author)
PB-195 010 HC$3.00 MF$0.65

THE 1966 GUERNSEY RESERVOIR SEDIMENT SURVEY,
Bureau of Reclamation, Denver, Colo. Office of Chief Engineer.
For primary bibliographic entry see Field 8H.
PB-195 013 HC$3.00 MF$0.65

ADVISORY CONFERENCE ON TUNNELLING HELD IN WASHINGTON, D.C. ON 22-26 JUNE 1970: PROCEEDINGS.
Open file rept.
Organisation for Economic Co-Operation and Development, Paris (France). Directorate for Scientific Affairs.
Aug 70, 190p* DAS/CSI/T/70.76 BuMines-OFR-13-70
See also PB-193 286.

Descriptors: (*Tunnelling (Excavation), Proceedings), Construction, Tunnels, Underwater, Soil mechanics, Rocks, Tunneling machines, Demand (Economics), Urban areas, Meetings.
Identifiers: *Soft ground tunneling, *Rock tunneling, *Immersed tunnel construction.

Included in the proceedings are all addresses, statements and reports presented at the plenary sessions, together with the recommendations of the Conference. (Working Documents also available - PB 193 286.) Proceedings cover reports on tunnelling demand, rock tunnelling, cut-and-Cover Construction, soft ground tunnelling, immersed tunnel construction, research and development related to tunnelling, and Conference recommendations. The appendix contains prepared comments of certain national deligations and official observers, as well as other items of general interest. (DOI abstract)
PB-195 014 HC$3.00 MF$0.65

URBAN DESIGN WITHIN THE COMPREHENSIVE PLANNING PROCESS,
Washington Univ., Seattle.
M. R. Wolfe, and R. D. Shinn. Apr 70, 257p*

Descriptors: (*Urban areas, Design), (*Urban planning, Manuals), Trends, Decision making, Shape, Models (Simulations), Community development, Environmental engineering, Land use zoning, Policies, Surveys, Substitutes, Time, Dispersions, Central city, Transportation.
Identifiers: Citizen participation.

The purpose is to provide a guideline document that amplifies the role of a design element in the planning process and that clarifies concepts of urban design in comprehensive urban planning. A model approach is established and a demonstration is given by applying it to an actual case study. The urban design component is considered, with two basic questions in mind: How urban design bears on other aspects of comprehensive planning, and what is involved in adding an urban design component to an existing comprehensive plan, noting it may be a matter of considering development forces explicitly since a design is integral in the process. (Author)
PB-195 031 HC$3.00 MF$0.65

REPORT ON WATER AND WASTEWATER FOR BROWARD COUNTY, FLORIDA.
Broward County Area Planning Board, Fort Lauderdale, Fla.

Feb 70, 270p
Prepared in cooperation with Benham-Blair and Affiliates of Florida, Inc.

Descriptors: (*Regional planning, *Florida), (*Water resources, Regional planning), (*Water pollution, Regional planning), Sewers, Financial management, Waste water, Water treatment.
Identifiers: *Broward County (Florida).

The report presents the recommendations resulting from a comprehensive water and wastewater study. The study is addressed to existing conditions; adequacy of water and wastewater facilities for present and future requirements; presentation of recommendations for future wholesale water and sewerage service, with attendant financing and administrative requirements. (Author)
PB-195 039 HC$3.00 MF$0.65

SURVEY RESULTS, CLEVELAND-HOPKINS AIRPORT ACCESS STUDY.
Final rept.
Regional Planning Commission, Cleveland, Ohio.

Jun 70, 163p* DOT-OS-A9-023-1
Contract DOT-OS-A9-023
See also AD-195 046 and PB-195 050.

Descriptors: (*Airports, *Rapid transit railways), (*Mass transportation, Airports), Attitude surveys, Traffic surveys, Bus lines, Automobiles, Tables (Data), Questionnaires, Ohio.
Identifiers: *Cleveland (Ohio), Cleveland Hopkins Airport, *Airport access.

The Cleveland Hopkins Airport Access Study consisted of an analysis of the impact of the rapid rail extension to Hopkins Airport. A survey of airport users at Hopkins Airport was conducted before the opening of the Cleveland Transit System rail transit service to the airport (Phase I) and another survey was conducted one year later (Phase II), after the rail rapid service was opened. The data from these surveys were compared to determine the effect of the new rail transit service on the choice of travel mode by the different groups of airport users. The report compares the results of the Phase I (before) and Phase II (after) surveys. (Author)
PB-195 045 HC$3.00 MF$0.65

SURVEY PROCEDURES, CLEVELAND-HOPKINS AIRPORT ACCESS STUDY.
Final rept.
Regional Planning Commission, Cleveland, Ohio.

May 70, 126p* DOT-OS-A9-023-2
Contract DOT-OS-A9-023
See also PB-195 045, PB-195 047 and PB-195 050.

Descriptors: (*Airports, *Rapid transit railways), (*Mass transportation, Airports), Questionnaires, Attitude surveys, Traffic surveys, Feasibility, Bus lines, Automobiles, Ohio.
Identifiers: *Cleveland (Ohio), Cleveland Hopkins Airport, *Airport access.

The Cleveland Hopkins Airport Access Study consisted of an analysis of the impact of the rapid rail extension to Hopkins Airport. A survey of airport users at Hopkins Airport was conducted before the opening of the Cleveland Transit System rail transit service to the airport (Phase I) and another survey was conducted one year later (Phase II), after the rail rapid service was opened. The data from these surveys were compared to determine the effect of the new rail transit service on the choice of travel mode by the different groups of airport users. This report documents the procedures used in the surveys for both Phase I (before surveys) and Phase II (after surveys). (Author)
PB-195 046 HC$3.00 MF$0.65

DATA FILE EDITING AND PRELIMINARY ANALYSIS, CLEVELAND-HOPKINS AIRPORT ACCESS STUDY.
Final rept.
Regional Planning Commission, Cleveland, Ohio.

May 70, 174p* DOT-OS-A9-023-3
Contract DOT-OS-A9-023
See also PB-195 046 and PB-195 048, and PB-195 050.

Descriptors: (*Airports, *Rapid transit railways), (*Mass transportation, Airports), Attitude surveys, Statistical analysis, Traffic surveys, Bus lines, Automobiles, Tables (Data), Ohio.
Identifiers: Cleveland Hopkins Airport, *Cleveland (Ohio), *Airport access.

The Cleveland Hopkins Airport Access Study consisted of an analysis of the impact of the rapid rail extension to Hopkins Airport. A survey of airport users at Hopkins Airport was conducted before the opening of the Cleveland Transit System rail transit service to the airport (Phase I) and another survey was conducted one year later (Phase II), after the rail rapid service was opened. The data from these surveys were compared to determine the effect of the new rail transit service on the choice of travel mode by the different groups of airport users. The report documents the procedures used in the preparation of files for analysis of the Phase I (before) and Phase II (after) surveys. (Author)
PB-195 047 HC$3.00 MF$0.65

DATA FILE FORMATS AND CODE DESCRIPTIONS, CLEVELAND-HOPKINS AIRPORT ACCESS STUDY.
Final rept.
Regional Planning Commission, Cleveland, Ohio.

Jun 70, 90p* DOT-OS-A9-023-4
Contract DOT-OS-A9-023
See also PB-195 047, PB-195 049, and PB-195 050.

Descriptors: (*Airports, *Rapid transit railways), (*Mass transportation, Airports), Machine coding, Digital techniques, Attitude surveys, Traffic surveys, Questionnaires, Ohio.
Identifiers: *Cleveland (Ohio), Cleveland Hopkins Airport, Airport access.

The Cleveland Hopkins Airport Access Study consisted of an analysis of the impact of the rapid rail extension to Hopkins Airport. A survey of airport users at Hopkins Airport was conducted before the opening of the Cleveland Transit System rail transit service to the airport (Phase I) and another survey was conducted one year later (Phase II), after the rail rapid service was opened. The data from these surveys were compared to determine the effect of the new rail transit service on the choice of travel mode by the different groups of airport users. The report documents the file formats and code descriptions for the Phase I (before) and Phase II (after) survey data tape (DOT-OS-A9-023-6). Magtape published as PB-195 050. (Author)
PB-195 048 HC$3.00 MF$0.65

AIR PASSENGER SURVEY SELECTED TABULATIONS, CLEVELAND-HOPKINS AIRPORT ACCESS STUDY.
Final rept.
Regional Planning Commission, Cleveland, Ohio.

Jun 70, 275p* DOT-OS-A9-023-5
Contract DOT-OS-A9-023
See also PB-195 048 and PB-195 050.

Descriptors: (*Airports, *Rapid transit railways), (*Mass transportation, Airports), Tables (Data), Attitude surveys, Traffic surveys, Ohio.
Identifiers: *Cleveland (Ohio), Cleveland Hopkins Airport, Airport access.

The Cleveland Hopkins Airport Access Study consisted of an analysis of the impact of the rapid rail extension to Hopkins Airport. A survey of airport users at Hopkins Airport was conducted before the opening of the Cleveland Transit System rail transit service to the airport (Phase I) and another survey was conducted one year later (Phase II), after the rail rapid service was opened. The data from these surveys were compared to determine the effect of the new rail transit service on the choice of travel mode by the different groups of airport users. The report presents selected tabulations from the Phase I (before) and Phase II (after) air passenger surveys. (Author)
PB-195 049 HC$3.00 MF$0.65

SURVEY DATA TAPE, CLEVELAND-HOPKINS AIRPORT ACCESS STUDY.
Final rept.
Regional Planning Commission, Cleveland, Ohio.

Jun 70, 1 reel magnetic tape* DOT-OS-A9-023-6
Contract DOT-OS-A9-023
Specify tape recording mode desired: 7 or 9 track 556 or 800 BPI and odd or even parity. (Note: 9 track is available only in 800 BPI odd parity). See also PB-195 045, PB-195 046, PB-195 047, PB-195 048 and PB-195 049.

Descriptors: (*Airports, *Rapid transit railways), (*Mass transportation, Airports), Data tapes, Attitude surveys, Traffic surveys, Ohio.
Identifiers: *Cleveland (Ohio), Cleveland Hopkins Airport, *Airport access.

The Cleveland Hopkins Airport Access Study consisted of an analysis of the impact of the rapid rail extension to Hopkins Airport. A survey of airport users at Hopkins Airport was conducted before the opening of the Cleveland Transit System rail transit service to the airport (Phase I) and another survey was conducted one year later (Phase II), after the rail rapid service was opened. The data from these surveys were compared to determine the effect of the new rail transit service on the choice of travel mode by the different groups of airport users. The data tape contains the response files from the air passenger, employee, casual visitor, parking lot and rapid transit interview surveys conducted in Phase I (before) and Phase II (after). The format and code descriptions are documented in the 'DATA FILE FORMATS -CODE DESCRIPTIONS' report, DOT-OS-A9-023-4. Format and record layout is described in PB-195 048. (Author)
PB-195 050 HC$55.00

BOOKS, PUBLICATIONS, PROJECT COMPLETION REPORTS, AND M. S. AND PH. D. THESES.
Iowa State Water Resources Research Inst., Ames.

30 Jun 70, 73p W71-00344, OWRR-A-999-1A (2)

Descriptors: (*Water resources, Reviews), Bibliographies, Books, Theses, Grants.

Books, publications, project completion reports and M. S. and Ph. D. theses related to research program activities supported under Office of Water Resources Research annual allotments and matching grants to the Iowa State Water Resources Research Institute are listed. Informative abstracts are also included for most references. (WRSIC abstract)
PB-195 082 HC$3.00 MF$0.65

FEASIBILITY OF A STABILIZATION-RETENTION BASIN IN LAKE ERIE AT CLEVELAND, OHIO.
Havens and Emerson, Cleveland, Ohio.
May 68, 194p W71-00411, FWQA-11020-05/68
Contract DI-14-12-27

Descriptors: (*Waste water, Settling basins), (*Settling basins, Great Lakes), Water treatment, Biochemical oxygen demand, Sedimentation, Stabilization, Cost estimates, Water quality, Abatement, Feasibility, Ohio.
Identifiers: *Cleveland (Ohio), *Lake Erie.

A feasibility study was conducted of a large stabilization-retention basin to be constructed in Lake Erie at Cleveland, Ohio. The stabilization is viewed as a possible alternative to separation of a combined sewer system. The proposed basin would treat flows from a number of large combined sewer overflows, from several polluted streams, and effluent from a large secondary wastewater treatment plant. Treatment would consist of bio-oxidation, sedimentation, stabilization and disinfection. The chemical, biological, physical and structural aspects of the proposed basin were studied, and the probable benefits to water quality and the effectiveness of the basin as a treatment device were evaluated. Estimates of cost of the basin and collection system were prepared, and it was concluded that the stabilization basin would provide a higher degree of pollution abatement than would separation of sanitary and storm sewers, at about one-third the cost. (WRSIC abstract)
PB-195 083 HC$3.00 MF$0.65

EVALUATION OF A SINGLE LAYERED GRADED GRAVEL AS A PROTECTIVE FILTER.
Missouri Water Resources Research Center, Columbia.
For primary bibliographic entry see Field 13M.
PB-195 084 HC$3.00 MF$0.65

WATER RESOURCES AND LAND USE OF THE PYRAMID LAKE INDIAN RESERVATION.
Final rept.
Wilsey and Ham, San Mateo, Calif.

Oct 70, 187p EDACOMM-70-012

Descriptors: (*Water resources, *Nevada), (*Economic development, Lakes), Employment, Land use, Stabilization, Irrigation, Electric power generation.
Identifiers: Pyramid Lake, Pyramid Paiute Indian Reservation, Tourism, *Indian reservations, Technical assistance projects.

The report presents data and makes recommendations for establishment of a permanent employment and income base for the Pyramid Paiute Indian Reservation in Nevada. Findings indicate public and private investment in the area have been inhibited because of uncertainty potable water supply, general land use planning, and the shrinking of the lake through diversion of the Truckee River. Restoration of river flows to stabilize the lake, and protection and enhancement of the lake to develop tourism are described as political and legal considerations. Economic value of water used to supplement flows in Pyramid Lake is discussed in terms of irrigation and operation of a power plant. Need for a general land use plan is described in terms of agriculture, town needs, conservation, and recreation and tourism. (EDA abstract)
PB-195 088 HC$3.00 MF$0.65

A REPORT TO THE SECRETARY OF TRANSPORTATION.
Citizens' Advisory Committee on Transportation Quality, Washington, D.C.

Sep 70, 42p* CACTQ-1

Descriptors: (*Transportation, Reviews), Government policies, Evaluation, Project planning, Land use, Financial management, Urban transportation, Mass transportation, Passenger transportation, Regulations, Rail transportation.
Identifiers: Citizens' Advisory Committee on Transportation, Citizen involvement.

The Committee acts in an advisory capacity to the Secretary of Transportation. This report sets forth the Committee's views on nine topics of importance to transportation. These are: Citizen involvement; Urban congestion, Commuting problems; The Interface problem; Land use; Transportation trust fund; A proposal to combine all regulatory bodies; Rail passenger act; and An ideal transportation system. (Author)
PB-195 134 HC$3.00 MF$0.65

DEVELOPMENT OF A SKID RESISTANCE TRAILER, PHASE I,
Oklahoma State Dept. of Highways. Research and Development Div.
Sparland L. Rose, and B. C. Hartronft. 27 May 70, 47p
Prepared in cooperation with Bureau of Public Roads, Washington, D.C.

Descriptors: (*Pavements, Skid resistance), (*Skid resistance, Test equipment), (*Trailers, Design), Highways, Research, Subassemblies, Development, Measuring instruments, Recording instruments, Effectiveness, Oklahoma.
Identifiers: *Skid resistance trailers.

The report describes the design and construction of a two-wheel trailer that will measure the skid resistance of the pavement surface in a wet condition. The trailer was designed both as a work unit to inventory the highway system and as a unit versatile enough for research. Detailed descriptions of various component parts and systems are discussed to provide accessible information for others desiring to construct a skid trailer. (Author)
PB-195 140 HC$3.00 MF$0.65

IRONTON, OHIO - ASHLAND, KENTUCKY - HUNTINGTON, WEST VIRGINIA. AIR POLLUTION ABATEMENT ACTIVITY.
Technical rept. Sep 65-Aug 67.
National Center for Air Pollution Control, Cincinnati, Ohio.

May 68, 86p APTD-68-2
Report on Pre-Conference Investigations.

Descriptors: (*Air pollution, *Urban areas), Abatement, History, Topography, Climatology, Particles, Sulfur dioxide, Hydrogen sulfide, Nitrogen oxides, Exhaust gases, Combustion products, Industrial wastes, Metal industry, Chemical industry, Portand cements, Dust, Refuse disposal, Atmospheric motion, Temperature inversions, Ohio, Kentucky, West Virginia.
Identifiers: *Ironton (Ohio), *Ashland (Kentucky), *Huntington (West Virginia), Soiling index, Open burning.

An extensive area survey of air pollution was conducted in the Ironton, Ohio; Ashland, Kentucky; Huntington, West Virginia region for the period of September 1965 to August 1967. The following topics are discussed: topography; climate; materials deterioration; industrial, municipal, and private emission sources; geographic distribution of pollutants; and measurement methods and locations. The pollutants of interest were particulates, NOx, SOx, and H2S. An emission inventory is included, along with discussions of some of the major pollution sources. (Author)
PB-195 142 HC$3.00 MF$0.65

EFFECTS OF GASOLINE ADDITIVES ON CARBURETOR AND PCV SYSTEM PERFORMANCE AS THEY RELATE TO EXHAUST EMISSIONS.
First year rept.
Scott Research Labs., Inc., San Bernardino, Calif.

30 Apr 70, 89p APTD-0591

Descriptors: (*Air pollution, *Exhaust gases), (*Fuel additives, Air pollution), Field tests, Gasoline engines, Carburetors, Automobiles, Manufacturers, Spark ignition engines.
Identifiers: *Positive crankcase ventilation, Automobile exhausts, PCV (Positive Crankcase Ventilation).

Three groups of 16 cars each or a total of 48 fleet vehicles will be driven in normal urban and suburban modes of operation over a 24,000 mile interval under controlled fuel conditions and maintenance. Each group of 16 cars is being operated on the same base fuel. Two of the three group's test fuels contain a gasoline additive which is added to the base fuel. Exhaust emission measurements were made as the vehicles started the test and at each subsequent 4,000 mile interval. An analysis of variance was conducted on each of the 19 emission parameters for the zero and 4,000 mile interval. A major conclusion reached on the basis of these analyses is that: no significant differences in emission parameters were determined at the 4,000 mile point on the basis of fuel employed. A secondary conclusion drawn concerns the make factor. That conclusion is: all emissions parameters vary significantly between makes; however, no single make is consistently the highest or lowest valued across the spectrum of the 19 emissions parameters measured. The VW vehicles were distinctly different to such a degree that their data were not included in the final analysis. (Author)
PB-195 143 HC$3.00 MF$0.65

PARKERSBURG, WEST VIRGINIA - MARIETTA, OHIO, AIR POLLUTION ABATEMENT ACTIVITY.
Supplemental technical rept. Mar 67-Aug 69.
National Air Pollution Control Administration, Durham, N.C.

Sep 69, 73p APTD-69-50

Descriptors: (*Air pollution, *Regional planning), (*Industrial wastes, Air pollution), (*Chemical industry, Air pollution), Abatement, Ohio, West Virginia, Topography, River basins, Sulfur dioxide, Chlorine, Particles, Fluorides, Odors, Lachrymators, Plants (Botany), Refuse disposal, Atmospheric motion, Combustion products, Chemical industry, Metal industry.
Identifiers: *Parkersburg (West Virginia), *Marietta (Ohio), *Plant damage, Eye irritants, Air pollution detection.

The report is based on an investigation of air pollution in the Parkersburg, West Virginia - Marietta, Ohio area for the period March 1967 to August 1969 and has been prepared as a supplement to the March 1967 technical report. Together these two reports are intended to assist the governmental agencies concerned with such air pollution in their consideration of the following: The occurrence of air pollution subject to abatement; The adequacy of measures taken toward abatement of pollution; The nature of the delay, if any, in abating pollution; and The necessary remedial action, if any. (Author)
PB-195 144 HC$3.00 MF$0.65

CHATTANOOGA, TENNESSEE - ROSSVILLE, GEORGIA INTERSTATE AIR QUALITY STUDY 1967-1968,
National Air Pollution Control Administration, Durham, N.C.
Grady T. Helms, James H. Southerland, Kenneth R. Woodard, Ibrahim J. Hindawi, and Dale H. Coventry. Oct 70, 122p APTD-0583

Descriptors: (*Air pollution, *Urban areas), (*Munitions industry, Air pollution), Army, Tennessee, Georgia, Particles, Nitrogen dioxide, Nitrogen oxide, Sulfur dioxide, Carbon monoxide, Atmospheric corrosion, Hydrocarbons, Exhaust gases, Combustion products, Sulfates, Ammonium compounds, Climatology, Refuse disposal, Vegetation, Nitric acid, Sulfuric acid, Industrial wastes, Nitrates.
Identifiers: *Chattanooga (Tennessee), *Rossville (Georgia), *Plant damage, Soiling index.

In 1965, the U.S. Army reactivated the Volunteer Army Ammunition Plant at nearby Tyner, Tennessee, to produce explosives needed for defense. Shortly thereafter numerous complaints of particulate and gaseous emissions were received by various governmental officials from many irate citizens in the surrounding area. On October 1, 1967, an air quality survey was begun in the Chattanooga, Tennessee - Rossville, Georgia, interstate area to fulfill both the request of the Department of Defense and the City of Chattanooga. Four other investigations were conducted in the area during the period from October 1967 through April 1969: (1) meteorological measurements; (2) vegetation effects measurements; (3) materials effects studies; and (4) emissions survey. This report concerns these investigations and their results. (Author)
PB-195 145 HC$3.00 MF$0.65

EVALUATION OF FOUR RURAL HOUSING PROGRAMS.
Final rept.
Auerbach Corp., Philadelphia, Pa.

10 Aug 70, 135p AUER-1711-FR-1
Grant OEO-B99-4980

Descriptors: (*Rural areas, Residential buildings), (*Residential buildings, Project management), Economic factors, Community development, California, Massachusetts, North Carolina, Florida, Alabama, Construction, Financial management.
Identifiers: *Low income housing.

The purpose of the study was to provide the Office of Economic Opportunity with an evaluation of four rural housing programs: Rural Development Corporation (RDC) in California; the rural component of the Low-Income Housing Development Corporation (LIHDC) in North Carolina; VISHA, operating in Florida and Alabama; and Rural Housing Improvement (RHI) in north central Massachusetts. The specific objectives of the evaluation were to assess the performance of each of these programs in terms of: (1) the organization of the programs, (2) the relationships with other groups and agencies, (3) outputs of the programs, and (4) clientele of the programs. (Author)
PB-195 147 HC$3.00 MF$0.65

OPTICAL MICROSCOPY AS APPLIED TO AIR POLLUTION STUDIES. A REFERENCE LIST,
National Air Pollution Control Administration, Cincinnati, Ohio.
For primary bibliographic entry see Field 14B.
PB-195 149 HC$3.00 MF$0.65

DESIGN OF A SIMPLE PLANT EXPOSURE CHAMBER.
National Center for Air Pollution Control, Cincinnati, Ohio.
Walter W. Heck, John A. Dunning, and Henry Johnson. 1968, 24p APTD-68-6

Descriptors: (*Air pollution, *Test chambers), (*Environment simulators, Air pollution), (*Plants (Botany), Air pollution), Exposure, Design, Gas distribution, Toxicity, Ozone, Humidity, Temperature, Light (Visible radiation), Air flow, Gas flow, Construction, Cost.

The chambers used in plant exposure studies at the National Center for Air Pollution Control utilize a dynamic, negative-pressure, single-pass flow system with uniformity of toxicant flow, mixing, and distribution in the chamber. The simple design, described herein, permits easy installation of numerous chambers in a single air-handling system while still permitting individual control of chambers. (Author)
PB-195 151 HC$3.00 MF$0.65

AIR QUALITY DATA FROM THE NATIONAL AIR SURVEILLANCE NETWORKS AND CONTRIBUTING STATE AND LOCAL NETWORKS 1966 EDITION.
National Air Pollution Control Administration, Durham, N.C.
1968, 167p APTD-68-9

Descriptors: (*Air pollution, *Urban areas), (*Particles, Air pollution), (*Radioactive contaminants, Air pollution), (*Metals, Air pollution), (*Rural areas, Air pollution), Concentration (Composition), Tables (Data), Hydrocarbons, Aromatic compounds, Sulfur dioxide, Nitrogen oxide (NO), District of Columbia, Carbon monoxide, Seasonal variations, Nitrogen dioxide, Pyrenes, Ammonium compounds, Sulfates, Diurnal variations, Antimony, Beryllium, Bismuth, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Magnesium, Molybdenum, Nickel, Tin, Titanium, Vanadium, Zinc.
Identifiers: Continuous air monitoring projects, Soiling index, National air sampling network, Chicago (Illinois), Cincinnati (Ohio), Denver (Colorado), Philadelphia (Pennsylvania), Saint Louis (Missouri).

Summaries and analyses in addition to basic data tabulations are presented. National summaries of pollutant levels, and figures illustrating variations in the levels of gaseous pollutants are presented. Data are given on the following topics: suspended particulates; organic particulates; radioactivity; nonmetallic inorganic particulates; metals; soiling index; gaseous pollutants; and measurements from the Colorado State network. (Author)
PB-195 155 HC$3.00 MF$0.65

MOTOR VEHICLE EXHAUST EMISSIONS - GARY, INDIANA,
National Air Pollution Control Administration, Durham, N.C.
C. R. Rehmann. 1968, 27p APTD-68-5

Descriptors: (*Air pollution, *Exhaust gases), (*Urban areas, Air pollution), Carbon monoxide, Hydrocarbons, Nitrogen oxides, Sulfur oxides, Crankcase fumes, Evaporation, Indiana.
Identifiers: *Gary (Indiana), Automobile exhausts.

The results of the motor-vehicle exhaust emission inventory are reported by a grid system on a map of the study area and by grids. The total amounts of pollutants (CO, HC, NOx, SOx, and particulates) emitted from motor vehicle exhausts are tabulated. Evaporative losses and crankcase emissions in the study area account for 47 percent of the total hydrocarbon emissions, and exhaust emissions compose the remaining 53 percent. Typical analysis of motor vehicle emissions was used to check these estimates. Three pollutants - carbon monoxide, hydrocarbons, and nitrogen oxides - comprise 99 percent of the total weight of exhaust emissions in the study area. Sulfur oxides and particulates generally compose the greater percentage of the pollution in an industrial-urbanized area; however, these pollutants comprise only a small portion of the total weight of exhaust emissions. These pollutants are significant because of their toxicity, particle size, and secondary reactions involving the formation of aerosols. The combined emission rate of sulfur oxides and particulates is 2,640 pounds per day. If this pollution were distributed over the 41.6 square miles that comprise the land area of the City of Gary, the emission density for these two pollutants would be 63.5 pounds per square mile as compared to the emission density for carbon monoxide of 845.9 pounds per square mile. The vehicle-mile average-speed approach is presently the most accurate method for estimating the emissions from motor vehicle exhausts. The total emission of sulfur oxides and particulates from motor vehicles is small as compared with the three major pollutants. The use of the emission factors based on the fixed-mode cycle does not, therefore, introduce much error in the total weight of pollutants. (Author)
PB-195 156 HC$3.00 MF$0.65

KANSAS CITY, KANSAS - KANSAS CITY, MISSOURI AIR POLLUTION ABATEMENT ACTIVITY. PHASE II. PRE-CONFERENCE INVESTIGATIONS.
Rept. for 1966-67.
National Center for Air Pollution Control, Cincinnati, Ohio.

Mar 68, 183p APTD-68-1

Descriptors: (*Air pollution, *Urban areas), Abatement, History, Topography, Particles, Exhaust gases, Combustion products, Industrial wastes, Temperature inversions, Meteorological data, Kansas, Missouri, Sulfur dioxide, Metals, Sulfates, Seasonal variations, Hydrocarbons, Carbon monoxide, Refuse disposal, Atmospheric motion, Incinerators.
Identifiers: *Kansas City (Kansas), *Kansas City (Missouri), Soiling index, Open burning.

The report is based upon an investigation of air pollution conducted in the Kansas City area during 1966 and 1967. The report is intended to assist the governmental agencies concerned with such air pollution in their consideration of the following: Occurrence of air pollution subject to abatement; Adequacy of measures taken toward abatement of pollution; Nature of delay, if any, in abating the pollution; and Necessary remedial action, if any. (Author)
PB-195 159 HC$3.00 MF$0.65

THE BENEFICIAL USE OF STORM WATER. A SYSTEM STUDY, DESIGN, AND EVALUATION OF THE LOCAL STORAGE, TREATMENT, AND REUSE OF STORM WATER.
Final rept.
Hittman Associates, Inc., Columbia, Md.

Aug 68, 378p HIT-344 W71-00409, FWQA-11030-DNK-08/68
Contract DI-14-12-20

Descriptors: (*Water supplies, *Maryland), (*Surface water runoff, Water supplies), (*Water treatment, Surface water runoff), Storm sewers, Water consumption, Water treatment devices, Mathematical analysis, Water quality.
Identifiers: *Columbia (Maryland), *Water treatment plants.

The report covers the work performed on the collection, storage, treatment, and reuse of storm water as a means of pollution control and water supply augmentation. A discussion is presented of the work performed in the analysis and optimization of the system; the conceptual designs of potable, sub-potable, and pollution control systems; the conceptual design of a system for controlling pollution using a 'conventional design' approach, the results of the system evaluation and plans for the demonstration of the local storage, treatment, and reuse of storm water. The appendices to this report include the derivations of the hydrology equations, survey reports on water usage and the public acceptance and legal aspects of reuse, design reports on the 'conventional' and demonstration system, detailed estimates on the cost of the demonstration program, and descriptive information on packaged water treatment plants. (Author)
PB-195 160 HC$3.00 MF$0.65

TREATMENT OF WASTE WATER-WASTE OIL MIXTURES.
Armco Steel Corp., Middletown, Ohio.

May 70, 151p W71-00410, FWPCA-12010-EZV-02/70
Grant WPRD-169-01-68
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $2.50 as I67.13/4: 12010EZV02/70.

Descriptors: (*Water pollution, *Oils), (*Metal industry, Water pollution), (*Industrial wastes, Water pollution), Lubricating oils, Iron and steel industry, Cold rolling, Coagulation, Polyelectrolytes, Flocculating, Flotating, Emulsification, Zeta potential, pH.
Identifiers: *Waste water treatment, *Water pollution control, *Oil pollution.

Cold reduction of steel strip results in the production of large quantities of waste water containing variable amounts of oil. A five stand tandem cold mill located at Armco Steel Corporation's Ashland, Kentucky Works produces 200 to 500 gpm of waste water containing 400 to 4,000 ppm of oil. The COD of the waste varies from 400 to 20,000 ppm. A treatment process and facility was developed, constructed, and demonstrated, on full scale, for the treatment of cold mill wastes. The treatment process utilized chemical coagulation to break the emulsions. The chemicals employed included alum, lime, clay and organic polylectrolyte. The process consisted of the following treatment steps; equalization, chemical addition and rapid mixing, flocculation, and dissolved air flotation. Zeta potential, streaming current, and particle size distribution were used in laboratory studies to describe the effect of the following variables on process kinetics; acid number, initial oil concentration, type of emulisifier, chemical dosage, order of chemical addition, reaction time, and final pH. Based on these studies, an hypothesis of the emulsion breaking mechanism was proprosed. Oil, COD, and turbidity were used in field studies to establish the effect of the following variables on treatment efficiency; chemical concentration, order of chemical addition, chemical mixing time, flocculation mixing time and speed, and air flotation time and recirculation rate. Based on these studies, design criteria and operating costs for this process were presented. (Author)
PB-195 161 MF$0.65

STREAM POLLUTION AND ABATEMENT FROM COMBINED SEWER OVERFLOWS, BUCYRUS, OHIO.
Water pollution control series.
Burgess and Niple Ltd., Columbus, Ohio.

Nov 69, 201p FWQA-DAST-32 FWQA-11024-FKN-11/69, W71-00412
Contract FWPCA-14-12-401
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $2.00 as 167.13/4: 11024FKN11/69.

Descriptors: (*Water pollution, *Sewage), (*Combined sewers, Water pollution), (*Storm sewers, Water pollution), Flow control, Overflows, Abatement, Sampling, Biochemical oxygen demand, Sediments, Coliform bacteria, Lagoons (Ponds), Chlorination, Sewage treatment, Monitors, Rainfall, Ohio.
Identifiers: *Sandusky River, *Bucyrus (Ohio), *Water pollution control.

The report contains the results of a detailed engineering investigation and comprehensive technical study to evaluate the pollutional effects from combined sewer overflows on the Sandusky River at Bucyrus, Ohio and to evaluate the benefits, economics and feasibility of alternate plans for pollution abatement from the combined sewer overflows. The City of Bucyrus is located near the upper end of the Sandusky River Basin which is tributary to Lake Erie. Bucyrus has an incorporated area of about 2,340 acres, a population of 13,000, and a combined sewer system with an average dry weather wastewater flow of 2.2 million gallons per day. A year long detailed sampling and laboratory analysis program was conducted on the combined sewer overflows in which the overflows were measured and sampled at 3 locations comprising 64% of the City's sewered area and the river flow was measured and sampled above and below Bucyrus. (Author)
PB-195 162 MF$0.65

WATER QUALITY CRITERIA FOR SELECTED RECREATION USES.
Final rept.,
Illinois Univ., Urbana. Water Resources Center.
Doyle W. Bishop, and Robert Aukerman. Sep 70, 142p* WRC-RR-33 W71-00471

Descriptors: (*Water quality, *Illinois), (*Recreational facilities, Water quality), Public opinion, Attitudes, Water pollution, Interviews.

Four types of outdoor recreationists were investigated to determine whether they differed in their attitudes, beliefs, and behavior regarding various water characteristics at Central Illinois water-based recreation sites. Using an attitude model derived from social-psychological research, the recreationists' attitudes toward the sites were estimated from their attitudes and beliefs about water characteristics. The site attitudes were regarded as indicators of the quality of the respondents' recreation experience resulting from characteristics of the water. The major analyses were comparisons of the recreationist groups' perceptions of the water, attitudes toward water characteristics, the site attitudes held because of water characteristics, reports of decreased site use because of water characteristics, and reports of probable termination of site use because of water characteristics. The results indicated that the four types of recreationists differed in their perceptions of the water, attitudes toward water characteristics, site attidues, and the reported water characteristics that had caused or might cause decreased site use. In addition to these group differences, there were strong individual differences within the various groups. Site attitudes were not highly related to reported behavior. (Author)
PB-195 164 HC$3.00 MF$0.65

AUTOMATED POTENTIOMETRIC TECHNIQUES FOR THE ON-SITE MONITORING OF IONS IMPORTANT IN WATER QUALITY CONTROL.
Missouri Univ., Columbia. Dept of Chemistry.
For primary bibliographic entry see Field 7D.
PB-195 167 HC$3.00 MF$0.65

ROTARY VIBRATORY FINE SCREENING OF COMBINED SEWER OVERFLOWS.
Water pollution control research series.

Cornell, Howland, Hayes and Merryfield, Corvallis, Oreg.
Mar 70, 82p FWQA-DAST-5 W71-00476, FWQA-11023-FDD-03/70

Descriptors: (*Storm sewers, *Strainers), Performance, Rotation, Solids, Removal, Pipes, Sewage treatment, Cost effectiveness, Surface water runoff, Combined sewers, Design, Feasibility.
Identifiers: *Rotary screens.

The objective of this study was to determine the feasibility, effectiveness, and economics of employing high-rate, fine-mesh screening for primary treatment of storm water overflow from combined sewer systems. The final form of the screening unit stands 63 inches high and has an outside diameter of 80 inches. The unit is fed by an 8-inch pipe carrying 1700 gpm (122 gal/min/sq ft) which is distributed to a 60-inch diameter rotating (60 rpm) stainless steel collar screen having 14 square feet of available screen area and a 165 mesh (105 micron opening, 47.1 percent open area). The screen is backwashed at the rate of 0.235 gallons of backwash water per 1000 gallons of applied sewage. Based on final performance tests run on dry-weather sewage, the unit is capable of 99 percent removal of floatable and settleable solids, 34 percent removal of total suspended solids and 27 percent removal of COD. The screened effluent is typically 92 percent of the influent flow. On the basis of a scale-up design of a 25 mgd screening facility, the estimated cost of treatment is 22 cents/1000 gallons.
PB-195 168 HC$3.00 MF$0.65

PROPOSED COMBINED SEWER CONTROL BY ELECTRODE POTENTIAL,
Water pollution control research series.
Merrimack Coll., North Andover, Mass.

Feb 70, 79p W71-00479, FWQA-11024-DOK-02/70

Descriptors: (*Water pollution, *Sewage), (*Flow control, *Electrodes), (*Storm sewers, Flow control), (*Combined sewers, Flow control), Overflow, Water analysis, Biochemical oxygen demand, Phosphorus, Nitrates, Chlorides.
Identifiers: *Water pollution control.

The effectiveness was investigated of electrode potential measurements to modulate discharges from combined and storm sewer overflows to reduce stream and estuarine pollution. Studies included varying the composition of sewage, flow rate and examining the tendency to polarize or coat the electrodes under actual flow conditions. The analysis of experimental results shows a high degree of correlation between the electrode potential of the sewage and its strength. Linear correlation coefficients between electrode potential were determined for BOD, COD, SULFIDES, TOTAL PHOSPHORUS, · NITRATES, AND CHLORIDES. It was demonstrated that the potential will be more negative the greater the S (-2) concentration, except when a small amount of DO is present which exerts an attenuating influence. Flows carrying substantial concentrations of reducing substances with a detrimental impact on the dissolved oxygen reservoir of any receiving waters must be kept from exerting their damaging influence on bathing beaches, tidal estuaries and other water resources. Controlling the flow from outfalls by the electrode potential should significantly help to minimize such insults to the environment. (Author)
PB-195 169 HC$3.00 MF$0.65

LEGAL ASPECTS OF WATER STORAGE FOR FLOW AUGMENTATION,
Virginia Polytechnic Inst., Blacksburg. Water Resources Research Center.
William R. Walker, and William E. Cox. Aug 70, 231p W71-00480, FWQA-1609-OFPW-03170
Grant FWPCA-WP-01087

Descriptors: (*Water storage, *Water law), Reservoirs, Water quality, Water flow, Law (Jurisprudence).

Enabling legislation for storage of water in Federal reservoirs for supply purposes and quality control through low-flow augmentation includes the Water Supply Act of 1958, the Watershed Protection and Flood Prevention Act, and the 1961 Amendment to the Federal Water Pollution Control Act. The Flood Control Act of 1944 and the Federal Water Power Act also have possible applicability. The enabling legislation and other law defining the operating procedure of the federal water resource agencies make water supply and water quality storage somewhat dependent on the provisions of state water law. State law may affect the acquisition of water rights for storage and the procedure whereby it is applied to its intended functions. The impact of state law on the acquisition process varies according to whether water rights are acquired by the United States or by a private party. When private interests are responsible, as in the case of water supply storage in Corps of Engineers and Soil Conservation facilities, the aquisition of rights is not as complex as when a Soverign is involved. Aquisition of water rights by the federal government gives rise to federal-state jurisdictional problems and several unresolved questions concerning water rights. (WRSIC abstract).
PB-195 170 HC$3.00 MF$0.65

AIR POLLUTANT EMISSION INVENTORY OF NORTHWEST INDIANA; A PRELIMINARY SURVEY 1966,
National Air Pollution Control Administration, Durham, N.C.
Guntis Ozolins, and C. Rehmann. Apr 68, 43p
APTD-68-4

Descriptors: (*Air pollution, *Urban areas), (*Metal industry, Air pollution), (*Refineries, Air pollution), Indiana, Combustion products, Industrial wastes, Exhaust gases, Refuse disposal, Particles, Hydrocarbons, Sulfur dioxide, Chemical industry, Iron and steel industry, Petroleum industry, Carbon dioxide, Nitrogen oxides, Electric power plants, Coal.
Identifiers: *East Chicago (Indiana), *Gary (Indiana), *Whiting (Indiana), *Hammond (Indiana), Open burning.

Sources of air pollutant emissions were surveyed to quantify the total pollution load emitted to the air over the Northwest Indiana communities of East Chicago, Gary, Hammond, and Whiting. The emissions are reported on an annual basis and subdivided into five major pollutants: particulates, sulfur oxides, nitrogen oxides, hydrocarbons, and carbon monoxide. The four major source categories that were utilized in reporting emissions from area and point sources are: fuel combustion in stationary sources, fuel combustion in mobile sources, combustion of refuse, and industrial process losses. The results of this survey are reported by city and illustrated on the grid system established by the Northwest Indiana Air Resource Management Program. (Author)
PB-195 172 HC$3.00 MF$0.65

COMMUNITY FACILITIES PLAN, FRANKLIN, NORTH CAROLINA.
North Carolina State Dept. of Local Affairs, Asheville. Div. of Community Planning.

Aug 70, 61p
Paper copy also available from N.C. Dept. of Local Affairs, Div. of Community Planning, P. O. Box 1991, Raleigh, N.C. 27602. $2.00.

Descriptors: (*Urban planning, *North Carolina), Public utilities, Police, Fire protection, Public health, Schools, Libraries.
Identifiers: *Franklin (North Carolina), *Community facilities.

The report studies the present adequacy and availability of public services, facilities and utilities for the Town of Franklin and the one-mile planning area of jurisdiction surrounding the town. Recommendations are made for the upgrading in quality and for expansion of public services offered the citizens of Franklin in order that these services keep pace with the growth of the community. (Author)
PB-195 174 HC$3.00 MF$0.65

THE SOUTH DAKOTA FLEXIBLE PAVEMENT RESEARCH PROJECT.
Final rept.
South Dakota Dept. of Highways. Physical Research Section.

1969, 142P

Descriptors: (*Flexible pavements, Bearing properties), Bearing capacity, Soil classification, Climatic changes, Traffic surveys, Construction costs, Maintenance standards, Deflection, Thickness, Dimensional measurement, South Dakota.

The report describes a comprehensive statewide investigation of selected in-service flexible pavements. The study was initiated in 1957 to determine the effects of geology, soils, climate , traffic and materials on pavement performance and cost, and to evaluate the existing design method. Most of the data was collected prior to 1963. However, the pedological mapping of each pavement project included in the study was not concluded until 1968. In the interim period much of the analysis was completed. Thirty-four projects, each having one of three different surface course types and located in one of six different major soil areas were selected for study. Traffic history was also considered. Testing operations included plate bearing, field CBR, Benkelman beam, BPR-type roughometer, Condition surveys, thickness measurements, material sampling and limited laboratory tests of materials. Field testing was generally conducted in the spring, summer and fall of each year. (BPR abstract)
PB-195 178 HC$3.00 MF$0.65

PAVEMENT DESIGN METHODS LITERATURE REVIEW-I,
Rensselaer Polytechnic Inst., Troy, N.Y. Winslow Labs.
J. B. Adeyeri, and R. L. Schiffman. Mar 65, 134p
Contract CPR-11-0989

Descriptors: (*Flexible pavements, Design criteria), Bibliographies, Viscoelastic theory, Plastic theory, Continuum mechanics, Boundary value problems, Friction factor, Wear, Climatic changes, Flexible foundations.

The various aspects of the rational design of flexible pavements are covered in the annotated bibliographies that make up this report. The literature is divided into two major categories. Bibliography (A) contains annotated references to pertinent literature concerned with the theories of elasticity and viscoelasticity. References to problems of stresses and displacements in systems that do not fall into the category of 'layered systems' are included. Specific boundary value problems referenced in this section are confined to half-space and half-plane problems. Bibliography (B) is an annotated bibliography of the pertinent literature in the mechanics of flaxible pavement behavior. References to problems concerned with stress and displacements of systems and in particulary layered systems are included. (BPR abstract)
PB-195 181 HC$3.00 MF$0.65

NUCLEAR MEASUREMENT OF SOIL PROPERTIES.
Virginia Highway Research Council, Charlottesville.
For primary bibliographic entry see Field 8M.

PB-195 182 HC$3.00 MF$0.65

PUBLIC FACILITIES PLAN NEWBERRY COUNTY, SOUTH CAROLINA.
South Carolina State Development Board, Columbia, Div. of Community Planning.
Jun 70, 163p SC-40-0014-0235

Descriptors: (*Regional planning, *South Carolina), Public buildings, Fire protection, Libraries, Schools, Medical services, Airports, Water resources, Sewers, Waste disposal.
Identifiers: *Newberry County (South Carolina), *Community facilities.

The study contains facts, conclusions and recommendations concerning existing and proposed community facilities. It points out present problems and deficiencies, and proposes solutions of a permanent and long-range nature. (Author)
PB-195 190 HC$3.00 MF$0.65

SETTLEMENT BEHIND BRIDGE ABUTMENTS. THE PERFORMANCE OF A UNIFORMLY-GRADED SAND FILL IN AN APPROACH EMBANKMENT ON THE M4 MOTORWAY,
Road Research Lab., Crowthorne (England).
For primary bibliographic entry see Field 13M.
PB-195 192 HC$3.00 MF$0.65

COMMUNITY DEVELOPMENT PLAN FOR LA GRANGE, ILLINOIS.
La Grange, Ill.

May 70, 86p
Prepared in cooperation with Nason, Wehrman, Knight and Chapman, Inc., Minneapolis, Minn.

Descriptors: (*Urban planning, *Illinois), (*Community development, Requirements), Land use, Management planning, Traffic control, Neighborhoods, Rehabilitation, Quality control, Urban areas, Residential buildings, Public buildings, Roads.
Identifiers: La Grange (Illinois).

The report contains the goals and objectives, land use plan, thoroughfares plan, and community facilities plan for the village of La Grange, Illinois. It is stated that the village should concentrate on maintaining high quality development and eliminating deterioration rather than encouraging changes in the patterns of land use and circulation. (Author)
PB-195 197 HC$3.00 MF$0.65

CENTRAL BUSINESS DISTRICT PLAN FOR LA GRANGE, ILLINOIS.
La Grange, Ill.

May 70, 66p
Prepared in cooperation with Nason, Wehrman, Knight and Chapman, Inc., Minneapolis, Minn.

Descriptors: (*Urban planning, *Illinois), (*Central city, Economic development), Surveys, Economic analysis, Commerce, Circulation, Parking facilities, Land use, Recommendations.
Identifiers: *La Grange (Illinois).

The report contains analysis of the economics, land use, and circulation of the La Grange Central Business District. It also presents recommendations for the improvement of the CBD. In order to maintain economic vitality, the commercial core of La Grange must be developed into a compact, pedestrian oriented retail complex. Major improvements necessary to stimulate such redevelopment are the construction of convenient parking facilities and the development of an efficient circulation system for vehicles and pedestrians. To further strengthen the CBD, development of high density residential uses is recommended in the area adjacent to the retail core and along the commuter line. The Central Business District is La Grange's largest industry. The recommended improvement program is essential to its economic growth, in terms of both retail sales and tax base. (Author)
PB-195 198 HC$3.00 MF$0.65

ENGINEERING INVESTIGATION OF SEWER OVERFLOW PROBLEM.
A detailed investigation into the cause and effect of sanitary sewer overflows and recommended remedial measures for Roanoke, Virginia.
Hayes, Seay, Mattern and Mattern, Roanoke, Va.
Wendle R. Snapp, and Robert A. Lemon. May 70, 250p FWPCA-11024-DMS-05/70, W71-00478
Contract FWPCA-14-12-200
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $2.00 as I67.13/4: 11024-DMS-05/70.

Descriptors: (*Sewers, Fluid infiltration), (*Storms, Surface water runoff), Overflows, Sewage, Rainfall intensity, Computer programming, Design, Cost estimates, Sampling, Water pollution, Control, Virginia.
Identifiers: *Roanoke (Virginia).

Results are given of investigations, on 25 percent of Roanoke, Virginia's separate sanitary sewerage system, on the amounts of infiltration for various storm intensities and durations and the amounts of sewage overflow from the system. From these results the system was analyzed, using an in-house developed computer program, to assess the magnitudes and frequencies of overflows. The generated data from the analysis were used to develop an optimum design for remedial measures to reduce sewer overflows. Costs estimates are presented for the various items of work involved. (Author)
PB-195 201 MF$0.65

FACTORS AFFECTING THE TRANSFER OF MATERIALS BETWEEN WATER AND SEDIMENTS.
Wisconsin Univ., Madison. Water Resources Center.
For primary bibliographic entry see Field 8H.
PB-195 220 HC$3.00 MF$0.65

FEASIBILITY OF A PERIODIC FLUSHING SYSTEM FOR COMBINED SEWER CLEANSING.
Final rept., Phase I.
FMC Corp., Santa Clara, calif. Central Engineering Labs.

Aug 67, 63p* FMC-R-2608 FWPCA-11020-DNO-08/67, W71-00623
Contract FWPCA-14-12-19

Descriptors: (*Combined sewers, *Flushing), Surface water runoff, Storms, Pollution, Test equipment, Design, Cost analysis, Cleaning, Feasibility, Automatic control.

One of the causes of pollution from stormwater overflow of combined sewers is the deposition of pollutional solids during dry weather flow followed by pick up of the pollutional material during storm flow when the flow be bypassed. As a solution to this problem, it has been proposed that a flushing system be used to periodically cleanse the sewers during dry weather and convey the solids to the treatment plant. A study was made of sewer flushing practices, application requirements, and hydraulic theory. Investigation was also made of sampling methods and equipment; flushing test equipment was designed and the cost was estimated. The existing information on sewer flushing has indicated a good possibility that a periodic flushing system would be feasible for reducing pollution from combined sewer stormwater overflow. The design of flushing evaluation equipment has been carried to the point that cost estimates can be made for construction of the equipment. A description of the design and the cost estimates are included. (WRSIC abstract)
PB-195 223 HC$3.00 MF$0.65

ECONOMIC ASPECTS OF OCEAN ACTIVITIES. VOLUME II. ECONOMIC FACTORS IN THE DEVELOPMENT OF A COASTAL ZONE.
Massachusetts Inst. of Tech., Cambridge.
Sep 70, 183p MSC-71-67
See also Volume 3, PB-195 225.

Descriptors: (*Coasts, *Economic analysis), (*Maine, *Refineries), (*Nuclear power plants, Benefit cost analysis), (*Urban planning, Economic analysis), (*Recreational facilities, *Beaches), Unemployment, Investments, Cost estimates, Water pollution, Financing, Government policies.
Identifiers: *Boston harbor.

The core of the report outlines the economics of the coastal zone in the abstract, defines the concept of economic efficiency, points out the mechanisms by which the private market can fail to allocate the coastal zone efficiently, introduces the concept of parochial benefits, outlines how local control can sometimes operate to produce allocations which are more inefficient than the private market, considers problems introduced by the fact that a decision-making body can almost never predict the future with certainty, and introduces techniques for incorporating this uncertainty into cost-benefit analysis. The practical problems, as well as the limitations, involved in the application of cost-benefit analysis to the coastal zone are explored in some detail in four specific examples: (1) The provision of a recreation facility in Boston Harbor; (2) The redevelopment of the coastal town of Hull, Massachusetts; (3) The location of a nuclear power plant near Plymouth Massachusetts; and (4) The establishment and location of a refinery complex in Maine and the associated oil distribution problem. (Author)
PB-195 224 HC$3.00 MF$0.65

ECONOMIC ASPECTS OF OCEAN ACTIVITIES. VOLUME III. ECONOMIC ASPECTS OF SOLID WASTE DISPOSAL AT SEA.
Massachusetts Inst. of Tech., Cambridge.

Sep 70, 134p* MSC-71-68
See also Volume 2, PB-195 224.

Descriptors: (*Waste disposal, *Oceans), (*Refuse disposal, Oceans), (*Economic analysis, Waste disposal), Benefit cost analysis, Cost estimates, Rural areas, Urban areas, Political parties, Ecology, Water pollution, Incinerators, Earth fills, Rail transportation, Water transportation, Composts, Garbage disposal, Paper, Metals, Glass, Plastics, Automobiles.
Identifiers: *Solid waste disposal, *Waste recycling.

The report concentrates on the economics (in a sense wide enough to include all costs and benefits) associated with the disposal of the solids normally found in the refuse collected by large coastal cities. It compares the market costs of various disposal alternatives and derives, through present value analysis, unit market disposal costs for sanitary land fill via rail haul, incineration on land, dumping of compacted bales at sea, and incineration at sea, pointing out the potential ecological problems inherent in each system, and the relevant available information. (Author)
PB-195 225 HC$3.00 MF$0.65

SOLID WASTE DISPOSAL SURVEY,
Clark County-Springfield Regional Planning Commission, Ohio.
Ralph J. Kramer. Dec 69, 89p
Prepared in cooperation with Ralph J. Kramer, Comer and Passe Consulting Engineer, Columbus, Ohio.

Descriptors: (*Regional planning, *Ohio), (*Waste disposal, Regional planning), Refuse disposal, Incinerators, Composts, Earth fills, Expenses.
Identifiers: *Clark County (Ohio), Sanitary landfills, Composting.

Alternative disposal methods for solid wastes are discussed in the report. Sanitary landfill, incineration plants and composting are compared in terms of cost and workability for the Clark County area. (Author)
PB-195 228 HC$3.00 MF$0.65

CAPITAL IMPROVEMENTS PROGRAM. COMPREHENSIVE TRANSPORTATION PLAN.
Clark County-Springfield Regional Planning Commission, Ohio.

Jun 70, 40p

Descriptors: (*Regional planning, *Ohio), Transportation, Project planning, Urban areas, Rural areas, Financial management, Roads, Bridges, Airports, Sanitary engineering, Fire departments, Public utilities.
Identifiers: *Clark County (Ohio), *Springfield (Ohio).

The purpose of the Capital Improvements Program Report is to assemble proposed projects at the various levels of government operating in Clark County and the City of Springfield and to program anticipated implementation over a given period of time. Project costs are estimated, and these, as well as the priorities and timing of projects are flexible. (Author)
PB-195 229 HC$3.00 MF$0.65

SELECTION OF MATERIALS FOR SUB-SURFACE DRAINS,
Road Research Lab., Crowthorne (England).
For primary bibliographic entry see Field 13M.
PB-195 258 HC$3.00 MF$0.65

CURRENT STATEWIDE HOUSING PROGRAMS,
Alaska State Housing Authority, Anchorage.
David E. Smith. 8 Sep 70, 17p

Descriptors: (*Regional planning, *Alaska), (*Residential buildings, Regional planning), Project planning, State government, Surveys, Reviews, Financial management.
Identifiers: State housing agencies.

The purpose of the report is to provide the Alaska State Housing Authority with a summary of the different approaches to state housing programs in the country at the present time. (Author)
PB-195 260 HC$3.00 MF$0.65

COMPREHENSIVE CONTINUING PLANNING PROGRAM FOR THE INDIANAPOLIS-MARION COUNTY METROPOLITAN AREA: ORGANIZING COMMERCIAL ACTIVITIES.
Department of Metropolitan Development, Indianapolis. Div. of Planning and Zoning.

Sep 70, 105p
Sponsored in part by Department of Housing and Urban Development, Washington, D.C.

Descriptors: (*Regional planning, *Indiana), Urban development, Central city, Parking facilities, Commerce.
Identifiers: *Marion County (Indiana), *Indianapolis (Indiana).

Contents: Urbanized and urbanizing areas; The form of urban development; The central business district; Inner city and suburban commercial areas, and Shopping centers.
PB-195 261 HC$3.00 MF$0.65

DYERSBURG ZONING AND SUBDIVISION. REPORT 11.
Dyersburg Regional Planning Commission, Tenn.

Jun 70, 96p
See also report no. 10, PB-195 263.

Descriptors: (*Urban planning, *Tennessee), Ordinances, Maps, Urban areas, Buildings, Public land.
Identifiers: *Dyersburg (Tennessee).

A zoning ordinance and zoning map were prepared for the City of Dyersburg in accordance with a comprehensive plan to regulate the location, height, number of stories and size of buildings and other structures, the size of yards and other open spaces, the density and distribution of population, and the uses of buildings, structures and land for business, industry, residence and other purposes in the City of Dyersburg, Tennessee. (Author)
PB-195 262 HC$3.00 MF$0.65

DYERSBURG PUBLIC IMPROVEMENTS PROGRAM AND CAPITAL BUDGET PLAN. REPORT 10.
Dyersburg Regional Planning Commission, Tenn.

Jun 70, 41p
Revision of report dated Mar 70. See also Report no. 11, PB-195 262.

Descriptors: (*Urban planning, *Tennessee), Public utilities, Population growth, Land development, Revenue, Financial management, Sanitary engineering, Schools, Fire departments.
Identifiers: *Dyersburg (Tennessee).

A list of recommended improvements was prepared from the utilities plan and related to population growth and future land development. Revenue was analyzed to determine the value of Bonds which could be issued to accomplish the improvements within the planning period. (Author)
PB-195 263 HC$3.00 MF$0.65

COMPREHENSIVE CITY PLAN, PERU, ILLINOIS.
Peru City Plan Commission, Ill.

Oct 70, 182p

Descriptors: (*Urban planning, *Illinois), Objectives, Policies, Economic development, Economic surveys, Demography, Residential buildings, Land use.
Identifiers: *Peru (Illinois).

The comprehensive plan report sets forth the long-range goals and planning policies and establishes the necessary guidelines for the future physical and economic development of Peru. (Author)
PB-195 265 HC$3.00 MF$0.65

OPERATIONS PLAN - SALEM AREA CONTINUING TRANSPORTATION STUDY.
Mid Willamette Valley Council of Governments, Salem, Oreg.

Jun 70, 41p

Descriptors: (*Regional planning, *Oregon), (*Transportation, Regional planning), Project planning, Financial management, Land use.
Identifiers: *Salem (Oregon), Marion County (Oregon).

Contents: Organizational structure for performing continuing planning; Scope of continuing planning, and Land use and travel forecasting procedures.
PB-195 267 HC$3.00 MF$0.65

PROPOSED INTERSTATE 305, SALEM, OREGON.
Mid Willamette Valley Council of Governments, Salem, Oreg.

Sep 69, 20p
Report on Continuing Salem Area Transportation Study.

Descriptors: (*Urban planning, *Oregon), (*Freeways, Urban planning), Project planning, Land use, Transportation, Interstate highway system.
Identifiers: *Salem (Oregon).

It has been determined by the Salem Area Transportation Study that a need exists and that it is in the public interst to construct a freeway spur from the north into Salem proper. One concept recommended by the Citizens Advisory Committee, appointed specifically to assure the compatibility of the I-305 freeway in the community is that of a linear parkway designed to preserve natural resources, and retain the highest aesthetic goals of the community in landscaping. (Author)
PB-195 268 HC$3.00 MF$0.65

POPULATION GROWTH IN THE MID WILLAMETTE VALLEY.
Mid Willamette Valley Council of Governments, Salem, Oreg.

Jan 70, 12p
Report on Continuing Salem Area Transportation Study.

Descriptors: (*Regional planning, *Oregon), (*Census, Regional planning), Population growth, Tables.
Identifiers: Mid Willamette Valley (Oregon).

The report presents a summarization of tables and graphs prepared from data published by the Center for Population Research and Census at Portland State University, in Portland, Oregon, and the Federal Census of April 1, 1960. The report depicts the population changes that have taken place from 1960 to 1969 in Polk, Marion, and Yamhill Counties. (Author)
PB-195 269 HC$3.00 MF$0.65

LAND USE INVENTORY PROCEDURE MANUAL.
Mid Willamette Valley Council of Governments, Salem, Oreg.

May 70, 41p

Descriptors: (*Urban planning, *Oregon), (*Land use, Urban planning), Maps, Data processing.
Identifiers: *Salem (Oregon).

The report is an instruction manual for conducting the land use inventory in the Salem Metropolitan Area. The manual includes instructions for the field inventory, recording data on the maps, defining land use areas to measure, measuring the areas, transcribing data to land use record sheets for keypunching and computer summarizing. (Author)
PB-195 270 HC$3.00 MF$0.65

HOUSING: CHALLENGES AND OBJECTIVES IN THE MID WILLAMETTE VALLEY.
Mid Willamette Valley Council of Governments, Salem, Oreg.

Jan 70, 134p

Descriptors: (*Regional planning, *Oregon), (*Residential buildings, Regional planning), Blighted areas, Surveys, Project planning, Local government, Financial management, Economic factors.
Identifiers: Mid Willamette Valley (Oregon), *Low income housing.

The report summarizes the programs that local government can and should undertake to solve the housing problem in the Mid Willamette Valley. For example, one recommendation, was to establish a tri-county Operation Breakthrough Agency to take advantage of the potential solutions that are made available through the Breakthrough Program. The report also summarizes the problems and obstacles facing local government. (Author)
PB-195 271 HC$3.00 MF$0.65

ENVIRONMENTAL SURVEILLANCE FOR PROJECT GASBUGGY PRODUCTION TEST PHASE.
Southwestern Radiological Health Lab., Las Vegas, Nev.

Jun 70, 39p PNE-G-63
Prepared in cooperation with Public Health Service, Las Vegas, Nev.

Descriptors: (*Nuclear explosions, Radioactive contaminants), (*Air pollution, *Radioactive contaminants), (*Water pollution, Radioactive contaminants), Underground explosions, Sampling, Tritium, Carbon 14, Krypton 85.
Identifiers: Plowshare operation, *Gasbuggy shot.

For abstract, see NSA 24 20.
SWRHL-100-r HC$3.00 MF$0.65

13C. Construction Equipment Materials, and Supplies

QUARTERLY BULLETIN OF THE DIVISION OF MECHANICAL ENGINEERING AND THE NATIONAL AERONAUTICAL ESTABLISHMENT.
National Research Council of Canada Ottawa (Ontario) Div of Mechanical Engineering
For primary bibliographic entry see Field 20D.
AD-713 489 HC$3.00 MF$0.65

PRELIMINARY COST ESTIMATE FOR THE RADIATION-INDUCED PLASTIC IMPREGNATION OF CONCRETE,
Brookhaven National Lab., Upton, N.Y.
L. E. Kukacka, M. Steinberg, and B. Manowitz. 1970, 18p*

Descriptors: (*Cement additives, *Polymers), Gamma irradiation, Polymethyl methacrylate, Polystyrene, Polyvinyl acetate, Polyethylene, Impregnating, Cost estimates.
Identifiers: *Concrete polymer composites, *Radiation polymerization.

For abstract, see NSA 24 20.
BNL-11263 HC$3.00 MF$0.65

THE INFLUENCE OF LOW FREQUENCY VIBRATIONS OF A CUTTING TOOL ON THE CUTTING OF SOIL,
National Tillage Machinery Lab., Auburn, Ala.
For primary bibliographic entry see Field 2C.
PB-194 848T HC$3.00 MF$0.65

THE USE OF AN ACCELERATED WEAR MACHINE TO EXAMINE THE SKIDDING RESISTANCE OF CONCRETE SURFACES,
Road Research Lab., Crowthorne (England).
D. E. Weller, and D. P. Maynard. 1970, 44p RRL-LR333

Descriptors: (*Concrete, Skid resistance), Roads, Test equipment, Wear tests, Surface properties, Construction materials, Mixtures, Great Britain.

An accelerated wear machine was developed to simulate on specimens tested in the laboratory the type of wear observed on concrete road surfaces. This machine can be used to examine the relative effects of various factors, e.g. materials and mix design, on the skid resistance value and on the retention of texture. It is not at present possible, however, to predict the exact performance of any particular surface under traffic. (Author)
PB-194 856 HC$3.00 MF$0.65

THE INFLUENCE OF MATERIALS AND MIX DESIGN ON THE SKID RESISTANCE VALUE AND TEXTURE DEPTH OF CONCRETE,
Road Research Lab., Crowthorne (England).
D. E. Weller, and D. P. Maynard. 1970, 47p* RRL-LR334

Descriptors: (*Concretes, Skid resistance), (*Roads, Wear tests), (*Construction materials, Skid resistance), Surface properties, Mixtures, Aggregates, Sands, Bauxite, Great Britain.

Accelerated wear tests were carried out on a wide range of concrete and mortar mixes in order to establish the influence of materials, the mix design and type of texture on the skid resistance values as measured by the portable tester and texture depths of concrete road surfaces. (Author)
PB-194 857 HC$3.00 MF$0.65

A REVIEW OF THE LOW-SPEED SKIDDING RESISTANCE OF A NUMBER OF CONCRETE ROADS CONTAINING VARIOUS AGGREGATES,
Road Research Lab., Crowthorne (England).
D. E. Weller. 1970, 48p RRL-LR335

Descriptors: (*Roads, *Skid resistance), (*Concrete, Skid resistance), Aggregates, Sands, Vehicular traffic, Limestone, Great Britain.

A review was made of the sideway force coefficient at 50 km/h and of the skidding resistance value of 23 concrete roads. All of the concrete mixes used contained natural sands but a few of the sands had a high limestone content. Only a few roads contained a coarse limestone aggregate and all of these roads were lightly trafficked. The report discusses the effect of traffic intensity, of the limestone content of the sand, of the grading of limestone coarse aggregate, of the degree of stone exposure and of the effect of the mix proportions. (Author)
PB-194 858 HC$3.00 MF$0.65

EVALUATION OF SEVERAL TYPES OF CURING AND PROTECTIVE MATERIALS FOR CONCRETE. PART I. LABORATORY AND OUTDOOR EXPOSURE PRELIMINARY TO FIELD TRIALS.
Final rept.,
Virginia Highway Research Council, Charlottesville.
Howard H. Newlon, Jr. Jul 70, 66p VHRC-70-R3

Descriptors: (*Concrete durability, *Cement additives), (*Air entrained concretes, Concrete durability), (*Linseed oil, *Concrete pavements), (*Coverings, Concrete pavements), Scaling, Skid resistance, Protective coatings, Polyethylene, Curing, Rubber coatings, Monomolecular films, Evaporation control, Accelerated tests.

Numerous proprietary products which are claimed to improve durability have been marketed as protective coatings, curing agents or combinations of the two. The end purpose of the project was to evaluate the performance of several of these materials under field conditions. Discussed is the research which consisted of preliminary evaluation testing to select the materials to be placed in the field. White pigmented resin, white polyethylene, and chlorinated rubber curing compounds were tested in combination with linseed oil protective coatings and a monomolecular film for their effects in retarding evaporation during the early stages of hydration. Based upon the data and discussion presented in the report it was concluded that: Properly entrained air is overwhelmingly the most effective defense against scaling caused by deicing chemicals; When insufficient entrained air is obtained, linseed oil treatments delay the onset of scaling; Linseed oil treatments are effective when applied to concrete previously cured with resin based curing membrane; Chlorinated rubber used as a combination curing and protective sealant is not effective on poorly air entrained concrete; The monomolecular evaporation retarding film showed some beneficial effects on resistance to scaling of non-air entrained concrete. (Author)
PB-194 885 HC$3.00 MF$0.65

POZZOLANIC REACTIONS IN SYNTHETIC FLY ASH.
Iowa State Univ., Ames. Engineering Research Inst.
For primary bibliographic entry see Field 7A.
PB-194 906 HC$3.00 MF$0.65

A THERMOVISCOELASTIC CHARACTERIZATION OF AN ASPHALTIC CONCRETE.
Research rept.,
Texas Transportation Inst., College Station.
D. Bynum, Jr. Aug 70, 59p RR-127-2
Sponsored in part by Texas Highway Dept. and Bureau of Public Roads, Washington, D.C.

Descriptors: (*Bituminous concretes, Axial stress), (*Flexible pavements, Axial stress), Asphalts, Viscoelasticity, Thermoelasticity, Cracking (Fracturing), Roads.

The report covers a thermoviscoelastic characterization of two types of asphaltic concrete tested in uniaxial compression and tension at various strain rates and temperatures. The first mixture was preheated, mixed, and compacted at 300 F. The second mixture was preheated, mixed, and compacted at 450 F. The data reduction and results for 55 tests are given in this report. The test conditions were constant strain rate loading over 5 decades of rate and a temperature range of -50 to 150 F. Fundamental material properties (ultimate strain, ultimate stress, ultimate secant modulus, and initial tangent modulus) were obtained in two of the fundamental loading modes, namely, uniaxial tension and uniaxial compression. Ultimate stress does not seem to be a suitable failure criteria for flexible concrete due to the evidence and facts presented. For practical purposes, ultimate strain appears to be a suitable failure criteria for flexible concrete. (Author)
PB-194 909 HC$3.00 MF$0.65

METHODS OF TEXTURING NEW CONCRETE ROAD SURFACES TO PROVIDE ADEQUATE SKIDDING RESISTANCE,
Road Research Lab., Crowthorne (England).
D. E. Weller, and D. P. Maynard. 1970, 79p RRL-LR290

Descriptors: (*Roads, Surface finishing), (*Skid resistance, Roads), (*Concrete, Surface finishing), Wear tests, Velocity, Great Britain.

The development of various methods for texturing the fresh surface of high speed concrete roads is discussed. The performance is reviewed of various roads including those textured by the type of wire broom specified in the current Ministry of Transport Specification for Road and Bridge Works. The rate of wear and the skidding resistance of slow and fast lane surfaces are examined. An examination is also made of the effect of the initial texture imposed on the rate of change in skidding resistance with increase in speed. (Author)
PB-194 965 HC$3.00 MF$0.65

INVESTIGATION OF SHRINKAGE COMPENSATING CEMENTS,
Bureau of Reclamation, Denver, Colo. Div. of General Research.
G. L. Kalousek. Oct 70, 16p REC-OCE-70-43

Descriptors: (*Expanding cements, *Cement additives), (*Pozzolans, Cement additives), (*Fly ash, Cement additives), Admixtures, Portland cements, Aluminates, Calcium inorganic compounds, Setting time, Crystallization, Hydration.
Identifiers: *Ettringite (Mineral), Lignosulfate.

Types K, M, and S expansive cements were investigated for expansive capabilities as unrestrained mortars made with and without fly ash and calcium lignosulfonate and cured at 50, 73, and 90 deg F. Restrained cement-sand mortars were studied at 73 and 90 deg F. Rates of formation and amounts of ettringite were related to ex-

tent and time of expansion and setting characteristics. All 3 types of cements without addition of admixtures showed satisfactory expansive capability. Fly ash and lignosulfonate affected variously, and frequently adversely, the expansive behavior. The key to controlling abnormal setting and expansive characteristics of these cements appears to be the control of rate and amount of ettringite precipitation. A clue for improving setting characteristics of one of the cements is presented. (Author)
PB-195 012 HC$3.00 MF$0.65

EVALUATION OF MASONRY COATINGS.
Louisiana Dept. of Highways. Research and Development Section.
For primary bibliographic entry see Field 11C.
PB-195 179 HC$3.00 MF$0.65

REFLECTION CRACK SEALING STUDY.
Louisiana Dept. of Highways. Research and Development Section.
For primary bibliographic entry see Field 11A.
PB-195 180 HC$3.00 MF$0.65

CREEP AND DRYING SHRINKAGE OF LIGHTWEIGHT AND NORMAL-WEIGHT CONCRETES,
National Bureau of Standards, Washington, D.C.
T. W. Reichard. 4 Mar 64, 38p NBS-Mono-74

Descriptors: (*Concretes, Mechanical properties), (*Lightweight aggregate concretes, Mechanical properties), Shrinkage, Creep properties, Compressive properties, Modulus of elasticity, Expanded clay aggregates, Expanded shale aggregates, Expanded slate aggregates.

A description is given of a series of tests and test results from an investigation of the mechanical properties of structural-grade lightweight and normal-weight concretes. The major part of the work was planned to obtain comparative values of compressive creep, drying shrinkage, strengths, and moduli of elasticity for concretes made with 24 lightweight and 5 natural, normal-weight aggregates and having the same nominal strength at the time the specimens were placed under load. Data are presented from a total of 76 different concretes which show that there is a wide range in values of the mechanical properties of concretes of the same nominal compressive strength. It is shown that relatively high values of creep and drying shrinkage are not always associated with lightweight concretes and that, in fact, some lightweight concretes have practically the same mechanical properties as some normal-weight concretes. In addition to environmental conditions, the two major factors affecting the creep of concrete appear to be the ratio of the applied stress to the strength at the time of loading, and the aggregate used. Curing conditions, type of cement, mix proportions, and several other variables appear to affect the creep chiefly insofar as they affect the stress-strength ratio. It was observed that the creep at the age of two years can be estimated from the 90-day results with reasonable accuracy. (Author)
PB-195 213 HC$3.00 MF$0.65

13D. Containers and Packaging

PERFORMANCE EVALUATION OF STAR PACK EXTERIOR SHIPPING CONTAINERS.
Technical rept.,
Air Force Packaging Evaluation Agency Wright-Patterson AFB Ohio
Matthew A. Venetos. Sep 70, 23p* Rept no. DSPEB-24

Descriptors: (*Containers, Acceptability), (*Air transportation, Containers), Design, Configuration, Drop testing, Vibration, Compressive properties, Test methods, Statistical data, Logistics.

The 'Star' pack design, currently used in the Air Force Fast Pack Program, utilizes a special exterior shipping container which is of a proprietory design. The purpose of this project was to compare this container design with commonly used standard containers with respect to handling, transportation, and stacking characteristics as well as cost. No significant differences in performance were noted amongst the three styles of containers evaluated. However, the metal stay edge used with the proprietory container design was identified as a potential hazard to handling personnel since the metal stays tended to form sharp, jagged edges when the containers were subjected to performance testing which included both drop tests and vibration tests. Based on the results of the test evaluation and potential cost savings of $32,000/per annum, the regular slotted container was recommended as a replacement for the currently used half telescope container with metal stay edge reinforcement. (Author)
AD-713 145 HC$3.00 MF$0.65

T-T INDICATING SYSTEMS,
Army Natick Labs Mass
For primary bibliographic entry see Field 15E.
AD-713 542 HC$3.00 MF$0.65

CRITICALITY CONSIDERATIONS IN BASKET DESIGN FOR IRRADIATED FUEL SHIPMENT,
Oak Ridge Gaseous Diffusion Plant, Tenn.
For primary bibliographic entry see Field 18J.
For abstract, see NSA 24 20.
K-L-6232 HC$3.00 MF$0.65

STRUCTURAL ANALYSIS OF SHIPPING CASKS. VOL. 8. EXPERIMENTAL STUDY OF THE STRESS-STRAIN PROPERTIES OF LEAD UNDER SPECIFIED IMPACT CONDITIONS.
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 18F.
For abstract, see NSA 24 20.
ORNL-TM-1312 (Vol.8) HC$3.00 MF$0.65

13E. Couplings, Fittings, Fasteners, and Joints

A GUIDE FOR ULTRASONIC TESTING AND EVALUATION OF WELD FLAWS.
Naval Ordnance Lab White Oak Md
For primary bibliographic entry see Field 13H.
AD-713 202 HC$3.00 MF$0.65

LINEAR SUSPENSION SYSTEM PARAMETER IDENTIFICATION,
Army Tank Automotive Command Warren Mich
Glenn A. Jackson, and James W. Grant. 1970, 16p

Descriptors: (*Suspension devices, Mathematical models), Springs, Oscillation, Damping, Partial differential equations, Force (Mechanics), Analog computers, Mathematical prediction, Errors, Response.
Identifiers: Computer analysis, Computerized simulation, Spring rate.

A mehod for measuring spring rate and damping coefficient is necessary for complete laboratory evaluation of a suspension component. The report outlines a technique by which a linear model is adjusted by an analog computer so that its parameters match those of the test specimen. The accuracy of this linear model is good unless the test specimen parameters are very non-linear. (Author)
AD-713 546 HC$3.00 MF$0.65

CORROSION OF ADVANCED STEAM GENERATOR ALLOY WELDMENTS IN 1100 AND 1200 F (595 AND 650 C) STEAM,
Southern Nuclear Engineering, Inc., Dunedin, Fla.
For primary bibliographic entry see Field 11F.
For abstract, see NSA 24 20.
CONF-700324-1 HC$3.00 MF$0.65

EVALUATION TESTING OF THERMOFIT SOLDER SLEEVES.
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
For primary bibliographic entry see Field 9A.
For abstract, see STAR 08 21.
N70-38170 HC$3.00 MF$0.65

13F. Ground Transportation Equipment

STUDY OF TRACTION OF PNEUMATIC TIRES WITH COMPACTIBLE SOIL,
National Tillage Machinery Lab., Auburn, Ala.
For primary bibliographic entry see Field 2C.
PB-194 841T HC$3.00 MF$0.65

THE ROLLING FRICTION OF WHEELS ON COMPACTED SOIL,
National Tillage Machinery Lab., Auburn, Ala.
For primary bibliographic entry see Field 2C.
PB-194 844T HC$3.00 MF$0.65

MULTIDISCIPLINARY ACCIDENT INVESTIGATION CASE NO. 70-7. CAR/FIXED OBJECT IMPACT.
Maryland Medical Legal Foundation, Inc., Baltimore.
For primary bibliographic entry see Field 13L.
PB-194 875 HC$3.00 MF$0.65

MULTIDISCIPLINARY ACCIDENT INVESTIGATION CASE NO. 7023. TRUCK/MOTORCYCLE, FRONTEND/REAREND.
Miami Univ., Coral Gables, Fla.
For primary bibliographic entry see Field 13L.
PB-194 876 HC$3.00 MF$0.65

MULTIDISCIPLINARY ACCIDENT INVESTIGATION CASE NO. UNM 10. ONE-CAR ROLLOVER, FREEWAY.
New Mexico Univ., Albuquerque.
For primary bibliographic entry see Field 13L.
PB-194 877 HC$3.00 MF$0.65

MULTIDISCIPLINARY ACCIDENT INVESTIGATION CASE NO. UNM 14. RIGHT ANGLE INTERSECTION COLLISION.
New Mexico Univ., Albuquerque.
For primary bibliographic entry see Field 13L.
PB-194 878 HC$3.00 MF$0.65

MULTIDISCIPLINARY ACCIDENT INVESTIGATION CASE NO. UNM 12. HIGH SPEED ROLLOVER.
New Mexico Univ., Albuquerque.
For primary bibliographic entry see Field 13L.
PB-194 886 HC$3.00 MF$0.65

MULTIDISCIPLINARY ACCIDENT INVESTIGATION CASE NO. UNM 17. TWO CAR INTERSECTION COLLISION.
New Mexico Univ., Albuquerque.
For primary bibliographic entry see Field 13L.
PB-194 887 HC$3.00 MF$0.65

TRAFFIC SYSTEMS REVIEWS AND ABSTRACTS. TRAFFIC FLOW THEORY. COMMUNICATION AND CONTROL SYSTEMS. COST EFFECTIVENESS METHODOLOGY. CUMULATIVE INDEXES: T-0001--T-0840.
Research Triangle Inst., Durham, N.C.

1969, 95p
Contract FH-11-6610
See also report dated 1968, PB-184 491.

Descriptors: (*Traffic engineering, Reviews), Theories, Telecommunication, Automatic control, Cost effectiveness, Methodology, Abstracts.
Identifiers: Traffic flow theory.

The publication is an assembly of traffic systems reviews and abstracts provided monthly. The main objective of the technical review service is to furnish critical reviews and abstracts of current literature in the topic areas of traffic flow theory, communication and control systems, and cost effectiveness methodology. (BPR abstract)
PB-194 891 HC$3.00 MF$0.65

SENSITIVITY ANALYSIS OF THE EVALUATION OF A BUS TRANSIT SYSTEM IN A SELECTED URBAN AREA.
Peat, Marwick, Livingston and Co., Washington, D.C.
For primary bibliographic entry see Field 13B.
PB-194 893 HC$3.00 MF$0.65

MULTIDISCIPLINARY ACCIDENT INVESTIGATION CASE NO. 6970-26. CAR/VAN - INTERSECTION.
Miami Univ., Coral Gables, Fla.
For primary bibliographic entry see Field 13L.
PB-194 901 HC$3.00 MF$0.65

MULTIDISCIPLINARY ACCIDENT INVESTIGATION CASE NO. UNM 05. CAR UNDERRUNNING TRUCK.
New Mexico Univ., Albuquerque.
For primary bibliographic entry see Field 13L.
PB-194 902 HC$3.00 MF$0.65

PREDICTION OF SUBJECTIVE RESPONSE TO ROAD ROUGHNESS USING THE GENERAL MOTORS-MICHIGAN DEPARTMENT OF STATE HIGHWAYS RAPID TRAVEL PROFILOMETER.
Final rept.,
Michigan Dept. of State Highways, Lansing.
L. F. Holbrook. Jul 70, 64p R-719
Prepared in cooperation with Bureau of Public Roads, Washington, D.C.

Descriptors: (*Roads, Roughness), (*Motor vehicle operators, Responses), Evaluation, Performance (Human), Statistical processes, Analysis of variance, Correlation techniques, Michigan, Mathematical models.
Identifiers: Road profiles, Rapid travel profilometers, Profilometers, Rating scales.

Using road profile to predict the way in which human beings will rate the rideability of a road surface requires both accurate profiles and correct psychophysical scaling. The purpose of the report is to show the relationships between profile parameters, roughometer values, and subjective response. A collateral finding is that the variety of methods used to measure human subjective response . A collateral finding is that the variety of methods used to measure human subjective response to ride, or serviceability, result in mathematically different psychophysical formulas. In short, the psychophysical function obtained depends on the assumptions of the caling procedure. (Author)
PB-194 911 HC$3.00 MF$0.65

EXECUTIVE SUMMARY. AUTOMOBILE DEFECT RECALL CAMPAIGNS.
Intext Transportation Research Div., Scranton, Pa.

1970, 14P* DOT-HS-800 279
Contract FH-11-6939
See also PB-194 935.

Descriptors: (*Automobiles, Defects), (*Defects, Correction), Attitudes, Time, Safety, Motor vehicles, Effectiveness, Consumers.
Identifiers: *Motor vehicle safety defect recall, *Customer satisfaction.

The purpose of the study was to survey and determine the 'time of correction' for car defects for those car-owners who received certified defect notification letters from manufacturers and took their vehicles to a dealer/repair shop for corrective action, and could report that their defective vehicles had been corrected. The time for corrective action would be from receipt of notification to actual defect correction. A further purpose was to assess the satisfaction of those who received these notices and the manner in which the defect recall campaign was handled, and to determine to what degree the owners of potentially defective vehicles were receiving notification letters. (Author)
PB-194 934 HC$3.00 MF$0.65

AUTOMOBILE DEFECT RECALL CAMPAIGNS. A SURVEY OF TIME PHASED EFFECTIVENESS AND OWNER SATISFACTION.
Final rept.
Intext Transportation Research Div., Scranton, Pa.

May 70, 158p* DOT-HS-800 280
Contract FH-11-6939
See also PB-194 934.

Descriptors: (*Automobiles, Defects), (*Defects, Correction), Attitudes, Safety, Effectiveness, Time, Motor vehicles, Consumers.
Identifiers: *Motor vehicle safety defect recall, *Customer satisfaction.

The primary purpose of the survey is to provide the National Highway Safety Bureau (NHSB) with information to estimate (a) the effectiveness of the compaigns on a time phased basis as structured in the questionnaire, and (b) the consumer reaction to the compaign in terms of satisfaction/dissatisfaction with the dealer. (Author)
PB-194 935 HC$3.00 MF$0.65

THE SCRIP SYSTEM OF THE D.C. TRANSIT SYSTEM, WASHINGTON, D.C.
Final rept.
Washington Metropolitan Area Transit Commission, D.C.

Jun 70, 64p*

Descriptors: (*Bus lines, District of Columbia), (*Passenger transportation, *Fees), (*Cash basis, Substitutes), Feasibility, Crimes, Prevention, Statistical data, Effectiveness, Management planning.
Identifiers: *Transit fare collection, *Scrip systems, Management information systems, Locked fare boxes, *Crime deterrence.

In 1968, the rate of bus robberies in Washington, D.C. was more than twice that of the previous year. The problem reached its climax on May 17, 1968, when six bus robberies occurred within a five hour period and a driver was killed in a seventh attempted robbery. Since the principal stimulus to these robberies was the $100 to $175 in cash that bus drivers were required to carry, the drivers' union urged that a fare system be initiated which would reduce the hazard to the drivers. The Washington Metropolitan Area Transit Commission applied for and received a mass transportation demonstration grant to determine the feasibility of using a fare system in which drivers would carry no cash but would issue scrip or redeemable coupons as change to passengers who did not have exact fare available. A major purpose of the project was to test whether use of this system would eliminate robberies of bus drivers. Such a system had never been tried in the United States. The scrip system was first put into limited use during the nighttime hours for a period of forty-five days beginning June 11, 1968. When this test proved successful, the system was extended to twenty-four hour per day use. In terms of the goals of the project, the most important question was whether the use of the scrip system had been successful in reducing assaults and robberies of drivers. Unquestionably, it did so. Only four robberies directly related to the transit system occurred between the time the initial test of the scrip plan began and the end of the project five months later. Losses were minimal, and no drivers or other bus company employees were injured. The WMATC staff therefore recommended that use of the scrip system be continued after the close of the project in October, 1968. It has continued to function effectively since that time. (Author)
PB-194 958 HC$3.00 MF$0.65

VEHICLE SPEED AND RURAL AUTOMOTIVE CRASH INJURY. PART I: ESTIMATED TRAVELING SPEED AND FATALITIES,
Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
For primary bibliographic entry see Field 13L.
PB-194 970 HC$3.00 MF$0.65

VEHICLE SPEED AND RURAL AUTOMOTIVE CRASH INJURY. PART II: ESTIMATED TRAVELING SPEED AND INJURIES IN SINGLE VEHICLE FRONTAL CRASHES.
Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
For primary bibliographic entry see Field 13L.
PB-194 971 HC$3.00 MF$0.65

AUTOMOBILE SIDE IMPACTS AND RELATED INJURIES.
Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
For primary bibliographic entry see Field 13L.
PB-194 972 HC$3.00 MF$0.65

TRUCKS IN RURAL INJURY PRODUCING AND PROPERTY DAMAGE UTAH ACCIDENTS.
Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
For primary bibliographic entry see Field 13L.
PB-194 973 HC$3.00 MF$0.65

POST-CRASH COMMUNICATIONS.
AIL, Deer Park, N.Y.
For primary bibliographic entry see Field 13L.
PB-194 974 HC$3.00 MF$0.65

DEALER WARRANTY: GARAGE REPAIR FOR TRUCKS AND BUSES.
Final rept. Sep 69-Jul 70,
Operations Research, Inc., Silver Spring, Md.
B. H. Lovejoy. 20 Jul 70, 97p ORI-TR-611 DOT-HS-800 290
Contract FH-11-7285

Descriptors: (*Trucks, *Maintenance standards), (*Buses (Vehicles), Maintenance standards), Surveys, Safety, Repair shops, Maintenance, Spare parts, Defects, Failure, Personnel, Suspension systems (Vehicles), Steering gear, Fuel systems, Brakes (Motion arresters).
Identifiers: *Dealer warranty.

The objectives of the study were to assess the safety adequacy of general repair practices and policy for trucks and buses as accomplished by various repair and maintenance facilities. Vehicle systems were limited to: Brake, Steering; Suspension; Fuel; and Engine Controls and Accessories. Emphasis was placed on categorization of results as scheduled maintenance and repair and unscheduled maintenance and repair. (Author)
PB-194 975 HC$3.00 MF$0.65

WAVE PHENOMENA IN TIRES.
Final rept.,
Iowa Univ., Iowa City. Dept. of Mechanics and Hydraulics.
William F. Ames. 1 Jul 70, 9p DOT-HS-800 291
Contracts FH-11-6090, NBS-CST-435

Descriptors: (*Tires, *Standing waves), Design, Rotation, Velocity, Safety.
Identifiers: Bias ply tires.

In operation the tire experiences a variety of dynamic processes which are highly undesirable

and potentially a threat to vehicle safety. Of all these the study of the traveling wave (sometimes called the standing wave) is the most highly developed, although as yet it is incomplete. The purpose of the report is to briefly summarize findings from the literature, present simple equations for estimating the critical rolling velocity of each tire, and to make recommendations on the future use of this information in the tire safety program. (Author)
PB-194 976 HC$3.00 MF$0.65

MULTIDISCIPLINARY ACCIDENT INVESTIGATION CASE NO. 70-4. CAR/FIXED OBJECT IMPACT.
Maryland Medical Legal Foundation, Inc., Baltimore.
For primary bibliographic entry see Field 13L.
PB-195 015 HC$3.00 MF$0.65

SPEED AND ACCIDENTS. VOLUME I.
Research Triangle Inst., Durham, N.C.
For primary bibliographic entry see Field 13L.
PB-195 016 HC$3.00 MF$0.65

SPEED AND ACCIDENTS. VOLUME II.
Research Triangle Inst., Durham, N.C.
For primary bibliographic entry see Field 13L.
PB-195 017 HC$3.00 MF$0.65

MULTIDISCIPLINARY ACCIDENT INVESTIGATION CASE NO. 031. CAR, ROLLOVER.
Miami Univ., Coral Gables, Fla.
For primary bibliographic entry see Field 13L.
PB-195 025 HC$3.00 MF$0.65

MULTIDISCIPLINARY ACCIDENT INVESTIGATION CASE NO. 1181D. CAR/TRUCK, HEADON COLLISION,
California Univ., Los Angeles. UCLA Collision Investigation Program.
For primary bibliographic entry see Field 13L.
PB-195 026 HC$3.00 MF$0.65

MULTIDISCIPLINARY ACCIDENT INVESTIGATION CASE NO. 6970-20. CAR/MOTORCYCLE, INTERSECTION COLLISION.
Miami Univ., Coral Gables, Fla.
For primary bibliographic entry see Field 13L.
PB-195 027 HC$3.00 MF$0.65

MULTIDISCIPLINARY ACCIDENT INVESTIGATION CASE NO. 28. FIXED OBJECT IMPACT,
Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
For primary bibliographic entry see Field 13L.
PB-195 029 HC$3.00 MF$0.65

HIGH-SPEED GROUND TRANSPORTATION SYSTEMS ENGINEERING STUDY. TRACKED AIR CUSHION VEHICLE SYSTEMS.
Final rept.
TRW Systems Group, Redondo Beach, Calif.

May 70, 623p* 06818-6039-RO-00 FRA-RT-71-59
Contract DOT-C-353-66

Descriptors: (*Passenger vehicles, Ground effect machines), (*Ground effect machines, *Tracked vehicles), Mass transportation, Performance, Induction motors, Evaluation, Electric propulsion, Cost estimates.
Identifiers: *Northeast Corridor Transportation project, TACV (Tracked Air Cushion Vehicles), *Tracked air cushion vehicles, High speed ground transportation, Rapid transit systems.

The tracked air cushion vehicle is one of several advanced ground transportation systems being studied by TRW Systems Group for the Department of Transportation as a possible means of providing safe, high-speed, high-capacity transportation along densely populated areas such as the Northeast Corridor. Based on requirements and constraints chosen for an operational system, subsystem alternatives are evaluated and the selected subsystems are synthesized into a TACV system. Cost and performance are estimated over a range of parameters, such as design cruise speed (150 to 350 mph) and vehicle capacity (50 to 150 passengers per vehicle). The configuration defined consists of trainable, electrically powered TACV's which collect power from trackside power rails mounted on the side of a channel guideway. Propulsion is by linear induction motors with variable frequency speed control. Control of the vehicles, singly or in trains, is automated and centralized. The vehicles are supported on and guided by peripheral jet air cushions with high pressure air provided by electrically driven axial flow compressors. (Author)
PB-195 030 HC$10.00 MF$0.65

IMPACT CAPABILITY OF SAFETY GLAZING MATERIALS.
Final rept.,
Southwest Research Inst., San Antonio, Tex.
R. N. Pierce, and W. R. Blackstone. Jun 70, 122p*
DOT-HS-800 305
Contract FH-11-7277

Descriptors: (*Laminated glass, *Standards), (*Motor vehicles, *Safety), Design standards, Performance standards, Crash tests, Performance tests, Impact, Windshields.

A free fall drop tester was designed and fabricated to attain data for usage in formulation of a Federal Motor Vehicle Safety Standard. The current ASA Z26.1-1966 was the basis for the design; the particular test technique employed and justification for certain physical limits on the equipment are discussed. Of greatest consequence was the usage of a statistical 'up-and-down' test on the samples to provide a means of conveniently conducting the tests with the practical emphasis on economy while attaining a more than sufficient assurance of the result. The information gathered pertained to the cracking, breaking and penetration characteristics of contemporary and candidate automotive safety glazing materials. The responses of these materials when impacted by four standard impact tools are tabulated, discussed, and illustrated. (Author)
PB-195 040 HC$3.00 MF$0.65

COMMUNITY ACTION PROGRAM FOR TRAFFIC SAFETY. GUIDE I: RESPONSIBILITIES OF LOCAL OFFICIALS,
National Association of Counties Research Foundation, Washington, D.C.
Mel D. Powell, Michael K. Gemmell, Donald Murray, and Warren P. Howe. Sep 70, 20p DOT-HS-800 309
Contract FH-11-7091

Descriptors: (*Traffic safety, *Management systems), Manuals, Problem solving, Surveys, Statistical data, Legislation, Standards, Organizations, Financing, Personnel.
Identifiers: Community action program, Management information systems.

The document contains a description and analysis of the traffic safety problem; the highway safety act; highway safety program standards; managing traffic safety activities; and four organizational models to coordinate local traffic safety programs. (Author)
PB-195 055 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT). THE BUS AND TRUCK SUPPLY COMPANY.
Compliance test rept.
Electrical Testing Labs., Inc., New York.

Sep 70, 10p* DOT-HS-610 264

Descriptors: (*Lamps, Evaluation), (*Vehicles, *Safety), (*Signal lights, Evaluation), Standards, Electric potential.
Identifiers: Turn signal lamps.

The Bus and Truck Part No. 456064-A7-2975 Self-Cancelling Turn Signal Operating Unit, Class A was examined for identification, and tested for 12-volt operation with the designated maximum lamp load of two No. 1073, two No. 1141 and four No. 89 signalling bulbs to each signalling side. (Author)
PB-195 056 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 103 (WINDSHIELD DEFROSTING AND DEFOGGING SYSTEMS). CHRYSLER CORPORATION 1970 DODGE CORONET.
Compliance test rept.
General Testing Labs., Inc., Springfield, Va.

Sep 70, 15p* DOT-HS-610 275

Descriptors: (*Passenger vehicles, *Safety), (*Windshields, *Defrosting), Fog, Ice, Moisture, Standards, Performance, Evaluation, Environmental tests.
Identifiers: *Defogging systems, *Vehicle heaters, Dodge Coronet automobiles.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 057 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). INLAND MANUFACTURING DIVISION (GENERAL MOTORS CORPORATION).
Compliance test rept.
Electrical Testing Labs., Inc., New York.

Sep 70, 10p* DOT-HS-610 279

Descriptors: (*Passenger vehicles, *Safety), (*Hoses, Hydraulic brakes), Standards, Environmental tests, Failure, Loads (Forces), Evaluation.
Identifiers: Inland brake hoses.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 058 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). INLAND MANUFACTURING DIVISION (GENERAL MOTORS CORPORATION).
Compliance test rept.
Electrical Testing Labs., New York.

Sep 70, 10p* DOT-HS-610 281

Descriptors: (*Passenger vehicles, *Safety), (*Hoses, Hydraulic brakes), Standards, Environmental tests, Failure, Loads (Forces), Evaluation.
Identifiers: Inland brake hoses.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 059 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). INLAND MANUFACTURING DIVISION (GENERAL MOTORS CORPORATION).
Compliance test rept.
Electrical Testing Labs., Inc., New York.

Sep 70, 10p* DOT-HS-610 282

Descriptors: (*Passenger vehicles, *Safety), (*Hoses, Hydraulic brakes), Standards, Environmental tests, Failure, Loads (Forces), Evaluation.
Identifiers: Inland brake hoses.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 060 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). ALFRED TEVES (GERMANY).
Compliance test rept.
Electrical Testing Labs., Inc., New York.

Sep 70, 10p* DOT-HS-610 283

Descriptors: (*Passenger vehicles, *Safety), (*Hoses, Hydraulic brakes), Standards, Environmental tests, Failure, Loads (Forces), Evaluation.
Identifiers: Alfred Teves brake hoses.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 061 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). CASTROL OILS, INC.
Compliance test rept.
Detroit Testing Lab., Mich.

Sep 70, 43p* DOT-HS-610 294

Descriptors: (*Passenger vehicles, *Safety), (*Hydraulic fluids, Evaluation), (*Brake fluids, Evaluation), Hydraulic brakes, Standards, Compatibility, Corrosion, Boiling points, Environmental tests.
Identifiers: Castrol Oils brake fluids.

The report contains data and results of tests performed on one type of automotive hydraulic brake fluid 70R3 - in accordance with Federal Motor Vehicle Safety Standard No. 116. The brake fluid was tested for: boiling point, flash point, viscosity, pH, fluid stability, corrosion, fluidity and appearance at low temperature, evaporation, water tolerance, compatibility, resistance to oxidation, effect on rubber and simulated service performance. (Author)
PB-195 062 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). KELLY-SPRINGFIELD TIRE COMPANY.
Compliance test rept.
Ogden Technology Labs., Inc., Monterey Park, Calif.

Sep 70, 20p* DOT-HS-610 301

Descriptors: (*Automobile tires, Evaluation), (*Tires, Tests), (*Safety, Tires), Visual inspection, Environmental tests, Failure, Wear resistance, Standards, Passenger vehicles, Loads (Forces).
Identifiers: Failure analysis, Kelly Springfield tires, All American tires, Foremost tires.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. Tests were made on the following tires manufactured by Kelly-Springfield Tire Co.: All American Ultra-Trac 900-15; and Foremost A F/X II G70-14 and E70-14. (DOT abstract)
PB-195 063 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). INLAND MANUFACTURING DIVISION (GENERAL MOTORS CORPORATION).
Compliance test rept.
Ogden Technology Labs., Inc., Monterey Park, Calif.

Oct 70, 33p* DOT-HS-610 323

Descriptors: (*Passenger vehicles, *Safety), (*Hoses, Hydraulic brakes), Standards, Environmental tests, Failure, Loads (Forces), Evaluation.
Identifiers: Inland brake hoses.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 064 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). INLAND MANUFACTURING DIVISION (GENERAL MOTORS CORPORATION).
Compliance test rept.
Ogden Technology Labs., Inc., Monterey Park, Calif.

Oct 70, 33p* DOT-HS-610 324
Contract FH-11-7255

Descriptors: (*Passenger vehicles, *Safety), (*Hoses, Hydraulic brakes), Standards, Environmental tests, Failure, Loads (Forces), Evaluation.
Identifiers: Inland brake hoses.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 065 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). INLAND MANUFACTURING DIVISION (GENERAL MOTORS CORPORATION).
Compliance test rept.
Ogden Technology Labs., Inc., Monterey Park, Calif.

Oct 70, 34p* DOT-HS-610 326
Contract FH-11-7255

Descriptors: (*Passenger vehicles, *Safety), (*Hoses, Hydraulic brakes), Standards, Environmental tests, Failure, Loads (Forces), Evaluation.
Identifiers: Inland brake hoses.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 066 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). INLAND MANUFACTURING DIVISION (GENERAL MOTORS CORPORATION).
Compliance test rept.
Ogden Technology Labs., Inc., Monterey Park, Calif.

Oct 70, 34p* DOT-HS-610 327
Contract FH-11-7255

Descriptors: (*Passenger vehicles, *Safety), (*Hoses, Hydraulic brakes), Standards, Environmental tests, Failure, Loads (Forces), Evaluation.
Identifiers: Inland brake hoses.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 067 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). INLAND MANUFACTURING DIVISION (GENERAL MOTORS CORPORATION).
Compliance test rept.
Ogden Technology Labs., Inc., Monterey Park, Calif.

Oct 70, 33p* DOT-HS-610 330
Contract FH-11-7255

Descriptors: (*Passenger vehicles, *Safety), (*Hoses, Hydraulic brakes), Standards, Environmental tests, Failure, Loads (Forces), Evaluation.
Identifiers: Inland brake hoses.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 068 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). FIAT S.P.A.
Compliance test rept.
Detroit Testing Lab., Mich.

Oct 70, 32p* DOT-HS-610 333
Contract FH-11-7326

Descriptors: (*Passenger vehicles, *Safety), (*Hoses, Hydraulic brakes), Standards, Environmental tests, Failure, Loads (Forces), Evaluation.
Identifiers: Fiat brake hoses.

The report contains the results of tests performed in accordance with Federal Motor Vehicle Safety Standard No. 106 on one (1) set of thirteen (13) 1/8 onch I.D. automotive hydraulic brake hoses. The hoses, Part No. 4104668, manufactured by FIAT, were tested for constriction, expansion, bursting strength, tensile strength, cold bend and salt spray corrosion resistance. (Author)
PB-195 069 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). WARWICK LABORATORIES, INC.
Compliance test rept.
Detroit Testing Lab., Mich.

Oct 70, 47p* DOT-HS-610 335
Contract FH-11-7326

Descriptors: (*Passenger vehicles, *Safety), (*Hydraulic fluids, Evaluation), (*Brake fluids, Evaluation), Hydraulic brakes, Standards, Com-

patibility, Corrosion, Boiling points, Environmental tests.
Identifiers: Warwick brake fluids.

The report contains data and results of tests performed on one type of automotive hydraulic brake fluid 70R3 - in accordance with Federal Motor Vehicle Safety Standard No. 116. The brake fluid was tested for: boiling point, flash point, viscosity, pH, fluid stability, corrosion, fluidity and appearance at low temperature, evaporation, water tolerance, compatibility, resistance to oxidation, effect on rubber and simulated service performance. (Author)
PB-195 070 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). V - O MANUFACTURING COMPANY.
Compliance test rept.
Detroit Testing Lab., Mich.

Oct 70, 39p* DOT-HS-610 336
Contract FH-11-7326

Descriptors: (*Passenger vehicles, *Safety), (*Hydraulic fluids, Evaluation), (*Brake fluids, Evaluation), Hydraulic brakes, Standards, Compatibility, Corrosion, Boiling points, Environmental tests.
Identifiers: V-O brake fluids.

The report contains data and results of tests performed on one type of automotive hydraulic brake fluid 70R3 - in accordance with Federal Motor Vehicle Safety Standard No. 116. The brake fluid was tested for: boiling point, flash point, viscosity, pH, fluid stability, corrosion, fluidity and appearance at low temperature, evaporation, water tolerance, compatibility, resistance to oxidation, effect on rubber and simulated service performance. (Author)
PB-195 071 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT). TOYOTA MOTOR COMPANY, LTD.
Compliance test rept.
Electrical Testing Labs., Inc., New York.

Oct 70, 16p* DOT-HS-610 339
Contract FH-11-7286

Descriptors: (*Lamps, Evaluation), (*Vehicles, *Safety), (*Signal lights, Evaluation), Standards, Electric potential.
Identifiers: Turn signal lamps.

The Toyota Model 81980-31020 Turn Signal Flasher was examined for identification, and tested for 12-volt operation with the specified design load of three No. 1073 signalling bulbs plus one No. 57 indicator bulb (calibrated to provide fixed load of 5.61 amperes plus or minus 1/2%). (Author)
PB-195 072 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT). TOYOTA MOTOR COMPANY, LTD.
Compliance test rept.
Electrical Testing Labs., Inc., New York.

Oct 70, 20p* DOT-HS-610 340
Contract FH-11-7286

Descriptors: (*Lamps, Evaluation), (*Vehicles, *Safety), (*Signal lights, Evaluation), Warning systems, Hazards, Standards, Electric potential.
Identifiers: Hazard warning signal lamps.

The Toyota Model 81980-20050 Hazard Warning Signal Flasher was examined for identification, and tested for 12-volt operation with the specified maximum lamp load of four No. 1073 signalling bulbs plus two No. 57 indicator bulbs; with the specified minimum lamp load of two No. 1073 signalling bulbs plus one No. 57 indicator bulb. (Author)
PB-195 073 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT). GENERAL MOTORS CORPORATION.
Compliance test rept.
Electrical Testing Labs., Inc., New York.

Oct 70, 11p* DOT-HS-610 360
Contract FH-11-7286

Descriptors: (*Lamps, Evaluation), (*Vehicles, *Safety), (*Signal lights, Evaluation), (*Identification lights, Evaluation), Standards, Lenses, Colors (Materials), Corrosion tests, Vibration tests, Moisture, Dust.
Identifiers: Turn signal lamps, Parking lamps, Pontiac Firebird automobiles.

The report contains the results of examination and test of 'Guide 22 SAE IP 70' front turn signal and parking lamp to demonstrate compliance with the applicable requirements of the Federal Motor Vehicle Safety Standard 108. (Author)
PB-195 074 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). THE DAYTON TIRE AND RUBBER COMPANY.
Compliance test rept.
Compliance Testing, Inc., Ravenna, Ohio.

Oct 70, 10p* DOT-HS-610 377

Descriptors: (*Automobile tires, Evaluation), (*Tires, Tests), (*Safety, Tires), Visual inspection, Environmental tests, Failure, Wear resistance, Standards, Passenger vehicles, Loads (Forces).
Identifiers: Failure analysis, Dayton tires, Davis tires.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. Tests were made on the following tires manufactured by Dayton Tire and Rubber Co.: Davis Luxary Premium Sentry 825-14. (DOT abstract)
PB-195 075 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). THE GOODYEAR TIRE AND RUBBER COMPANY.
Compliance test rept.
Ogden Technology Labs., Inc., Deer Park, N.Y. Test Lab.

Oct 70, 8p* DOT-HS-610 382

Descriptors: (*Automobile tires, Evaluation), (*Tires, Tests), (*Safety, Tires), Visual inspection, Environmental tests, Failure, Wear resistance, Standards, Passenger vehicles, Loads (Forces).
Identifiers: Failure analysis, Goodyear tires.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. Tests were made on the following tire manufactured by Goodyear Tire and Rubber Co.: Goodyear Power Cushion Polyglas H78-14. (DOT abstract)
PB-195 076 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 103 (WINDSHIELD DEFROSTING AND DEFOGGING SYSTEMS). FORD MOTOR COMPANY 1970 GALAXIE FORD.
Compliance test rept.
General Testing Labs., Inc., Springfield, Va.

Sep 70, 12p* DOT-HS-610 274

Descriptors: (*Passenger vehicles, *Safety), (*Windshields, *Defrosting), Fog, Ice, Moisture, Standards, Performance, Evaluation, Environmental tests.
Identifiers: *Defogging systems, *Vehicle heaters, Ford Galaxie automobiles.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 080 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). INLAND MANUFACTURING DIVISION (GENERAL MOTORS CORPORATION).
Compliance test rept.
Electrical Testing Labs., Inc., N.Y.

Sep 70, 11p* DOT-HS-610 280

Descriptors: (*Passenger vehicles, *Safety), (*Hoses, Hydraulic brakes), Standards, Environmental tests, Failure, Loads (Forces), Evaluation.
Identifiers: Inland brake hoses.

The report pertains to test conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 081 HC$3.00 MF$0.65

MULTIDISCIPLINARY ACCIDENT INVESTIGATION CASE NO. MCR-70-7. CAR/CAR BROADSIDE (INTERSECTION),
Indiana Univ., Bloomington.
For primary bibliographic entry see Field 13L.
PB-195 092 HC$3.00 MF$0.65

MULTIDISCIPLINARY ACCIDENT INVESTIGATION CASE NO. 7013. GUARDRAIL IMPACT - ROLLOVER.
Southwest Research Inst., San Antonio, Tex.
For primary bibliographic entry see Field 13L.
PB-195 093 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 105 (BRAKES). FORD MOTOR COMPANY 1970 FORD THUNDERBIRD.
Compliance test rept.
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.

Sep 70, 99p* DOT-HS-610 276
Contract FH-11-7184

Descriptors: (*Brakes (Motion arresters), Evaluation), (*Passenger vehicles, *Safety), Standards, Road tests, Environmental tests, Performance.
Identifiers: *Vehicle brakes, Ford Thunderbird automobiles.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 094 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 105 (BRAKES). GENERAL MOTORS CORPORATION 1970 CHEVROLET IMPALA.
Compliance test rept.
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.

Sep 70, 86p* DOT-HS-610 277
Contract FH-11-7184

Descriptors: (*Brakes (Motion arresters), Evaluation), (*Passenger vehicles, *Safety), Standards, Road tests, Environmental tests, Performance.
Identifiers: *Vehicle brakes, Chevrolet Impala automobiles.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 095 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 105 (BRAKES). GENERAL MOTORS CORPORATION 1970 BUICK ELECTRA 225.
Compliance test rept.,
Detroit Testing Lab., Mich.
William J. Eubank. Sep 70, 116p* DOT-HS-610 278
Contract FH-11-7326

Descriptors: (*Brakes (Motion arresters), Evaluation), (*Passenger vehicles, *Safety), Standards, Road tests, Environmental tests, Performance.
Identifiers: *Vehicle brakes, Buick Electra 225 automobiles.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 096 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). LOCKHEED (ENGLAND).
Compliance test rept.,
Detroit Testing Lab., Mich.
William J. Eubank. Sep 70, 32p* DOT-HS-610 284
Contract FH-11-7326

Descriptors: (*Passenger vehicles, *Safety), (*Hoses, Hydraulic brakes), Standards, Environmental tests, Failure, Loads (Forces), Evaluation.
Identifiers: Lockheed brake hoses.

The report contains the results of tests performed in accordance with Federal Motor Vehicle Safety Standard No. 106 on one (1) set of thirteen (13) 1/8 inch I.D. automotive hydraulic brake hoses. The hoses, Part No. 4352-058, manufactured by Lockheed, were tested for constriction, expansion, bursting strength, tensile strength, cold bend and salt spray corrosion resistance. (Author)
PB-195 097 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). RIVERSIDE (MONTGOMERY WARD).
Compliance test rept.,
Detroit Testing Lab., Mich.
Caulton Ray, Jr. Sep 70, 42p* DOT-HS-610 285

Descriptors: (*Passenger vehicles, *Safety), (*Hydraulic fluids, Evaluation), (*Brake fluids, Evaluation), Hydraulic brakes, Standards, Compatibility, Corrosion, Boiling points, Environmental tests.
Identifiers: Riverside brake fluids.

The report contains data and results of tests performed on one type of automotive hydraulic brake fluid 70R3 - in accordance with Federal Motor Vehicle Safety Standard No. 116. The brake fluid was tested for: boiling point, flash point, viscosity, pH, fluid stability, corrosion, fluidity and appearance at low temperature, evaporation, water tolerance, compatibility, resistance to oxidation, effect on rubber and simulated service performance. (Author)
PB-195 098 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). NIEHOFF AND COMPANY.
Compliance test rept.,
Detroit Testing Lab., Mich.
Caulton Ray, Jr. Sep 70, 43p* DOT-HS-610 286

Descriptors: (*Passenger vehicles, *Safety), (*Hydraulic fluids, Evaluation), (*Brake fluids, Evaluation), Hydraulic brakes, Standards, Compatibility, Corrosion, Boiling points, Environmental tests.
Identifiers: Niehoff brake fluids.

The report contains data and results of tests performed on one type of automotive hydraulic brake fluid 70R3 - in accordance with Federal Motor Vehicle Safety Standard No. 116. The brake fluid was tested for: boiling point, flash point, viscosity, pH, fluid stability, corrosion, fluidity and appearance at low temperature, evaporation, water tolerance, compatibility, resistance to oxidation, effect on rubber and simulated service performance. (Author)
PB-195 099 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). SEARS ROEBUCK AND COMPANY.
Compliance test rept.,
Detroit Testing Lab., Mich.
Caulton Ray, Jr. Sep 70, 42p* DOT-HS-610 287

Descriptors: (*Passenger vehicles, *Safety), (*Hydraulic fluids, Evaluation), (*Brake fluids, Evaluation), Hydraulic brakes, Standards, Compatibility, Corrosion, Boiling points, Environmental tests.
Identifiers: Sears Roebuck brake fluids.

The report contains data and results of tests performed on one type of automotive hydraulic brake fluid 70R1 - in accordance with Federal Motor Vehicle Safety Standard No. 116. The brake fluid was tested for: boiling point, flash point, viscosity, pH, fluid stability, corrosion, fluidity and appearance at low temperature, evaporation, water tolerance, compatibility, resistance to oxidation, effect on rubber and simulated service performance. (Author)
PB-195 100 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). TECHNICAL CHEMICAL COMPANY.
Compliance test rept.,
Detroit Testing Lab., Mich.
Caulton Ray, Jr. Sep 70, 42p* DOT-HS-610 288

Descriptors: (*Passenger vehicles, *Safety), (*Hydraulic fluids, Evaluation), (*Brake fluids, Evaluation), Hydraulic brakes, Standards, Compatibility, Corrosion, Boiling points, Environmental tests.
Identifiers: Technical Chemical brake fluids.

The report contains data and results of tests performed on one type of automotive hydraulic brake fluid 70R3 - in accordance with Federal Motor Vehicle Safety Standard No. 116. The brake fluid was tested for: boiling point, flash point, viscosity, pH, fluid stability, corrosion, fluidity and appearance at low temperature, evaporation, water tolerance, compatibility, resistance to oxidation, effect on rubber and simulated service performance. (Author)
PB-195 101 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). UNITED CO-OPERATIVES.
Compliance test rept.,
Detroit Testing Lab., Mich.
Caulton Ray, Jr. Sep 70, 43p* DOT-HS-610 289
Contract FH-11-7326

Descriptors: (*Passenger vehicles, *Safety), (*Hydraulic fluids, Evaluation), (*Brake fluids, Evaluation), Hydraulic brakes, Standards, Compatibility, Corrosion, Boiling points, Environmental tests.
Identifiers: United Co-Operatives brake fluids.

The report contains data and results of tests performed on one type of automotive hydraulic brake fluid 70R3 - in accordance with Federal Motor Vehicle Safety Standard No. 116. The brake fluid was tested for: boiling point, flash point, viscosity, pH, fluid stability, corrosion, fluidity and appearance at low temperature, evaporation, water tolerance, compatibility, resistance to oxidation, effect on rubber and simulated service performance. (Author)
PB-195 102 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). INTERNATIONAL METAL POLISH.
Compliance test rept. (Final),
Detroit Testing Lab., Mich.
Caulton Ray, Jr. Sep 70, 43p* DOT-HS-610 290
Contract FH-11-7326

Descriptors: (*Passenger vehicles, *Safety), (*Hydraulic fluids, Evaluation), (*Brake fluids, Evaluation), Hydraulic brakes, Standards, Compatibility, Corrosion, Boiling points, Environmental tests.
Identifiers: International Metal Polish brake fluids.

The report contains data and results of tests performed on one type of automotive hydraulic brake fluid 70R3 - in accordance with Federal Motor Vehicle Safety Standard No. 116. The brake fluid was tested for: boiling point, flash point, viscosity, pH, fluid stability, corrosion, fluidity and appearance at low temperature, evaporation, water tolerance, compatibility, resistance to oxidation, effect on rubber and simulated service performance. (Author)
PB-195 103 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). WAGNER ELECTRIC CORPORATION.
Compliance test rept.,
Detroit Testing Lab., Mich.
Caulton Ray, Jr. Sep 70, 44p* DOT-HS-610 291
Contract FH-11-7326

Descriptors: (*Passenger vehicles, *Safety), (*Hydraulic fluids, Evaluation), (*Brake fluids, Evaluation), Hydraulic brakes, Standards, Compatibility, Corrosion, Boiling points, Environmental tests.
Identifiers: Wagner Electric brake fluids.

The report contains data and results of tests performed on one type of automotive hydraulic brake fluid 70R3 - in accordance with Federal Motor Vehicle Safety Standard No. 116. The brake fluid was tested for: boiling point, flash point, viscosity, pH, fluid stability, corrosion, tolerance, compatibility, resistance to oxidation, effect on rubber and simulated service performance. (Author)
PB-195 104 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). UNIROYAL MERCHANDISING, INC.
Compliance test rept.
Detroit Testing Lab., Mich.

Sep 70, 42p* DOT-HS-610 292

Descriptors: (*Passenger vehicles, *Safety), (*Hydraulic fluids, Evaluation), (*Brake fluids, Evaluation), Hydraulic brakes, Standards, Compatibility, Corrosion, Boiling points, Environmental tests.
Identifiers: Uniroyal brake fluids.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 105 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). CASTROL OILS, INC.
Compliance test rept.
Detroit Testing Lab., Mich.
Caulton Ray, Jr. Sep 70, 44p* DOT-HS-610 293

Descriptors: (*Passenger vehicles, *Safety), (*Hydraulic fluids, Evaluation), (*Brake fluids, Evaluation), Hydraulic brakes, Standards, Compatibility, Corrosion, Boiling points, Environmental tests.
Identifiers: Castrol Oils brake fluids.

The report contains data and results performed on one type of automotive hydraulic brake fluid 70R3 - in accordance with Federal Motor Vehicle Safety Standard No. 116. The brake fluid was tested for: boiling point, flash point, viscosity, pH, fluid stability, corrosion, fluidity and appearance at low temperature, evaporation, water tolerance, compatibility, resistance to oxidation, effect on rubber and simulated service performance. (Author)
PB-195 106 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 202 (HEAD RESTRAINTS). FORD MOTOR COMPANY 1970 GALAXIE FORD.
Compliance test rept.
General Testing Labs., Inc., Springfield, Va.

Sep 70, 19p* DOT-HS-610 295
Contract FH-11-7197

Descriptors: (*Passenger vehicles, *Safety), (*Seats, Human factors engineering), Standards, Head (Anatomy), Loads (Forces), Environmental tests, Evaluation.
Identifiers: *Head restraints (Vehicles), Ford Galaxie automobiles.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 107 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 105 (BRAKES). GENERAL MOTORS CORPORATION 1970 CHEVROLET MONTE CARLO.
Compliance test rept.
Dynamic Science, Phoenix, Ariz. AvSER Facility.

Sep 70, 134p* DOT-HS-610 304
Contract FH-11-7190

Descriptors: (*Brakes (Motion arresters), Evaluation), (*Passenger vehicles, *Safety), Standards, Road tests, Environmental tests, Performance.
Identifiers: *Vehicle brakes, Chevrolet Monte Carlo automobiles.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 108 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). THE WEATHERHEAD COMPANY.
Compliance test rept.
Ogden Technology Labs., Inc., Monterey Park, Calif.

Oct 70, 33p* DOT-HS-610 322
Contract FH-11-7255

Descriptors: (*Passenger vehicles, *Safety), (*Hoses, Hydraulic brakes), Standards, Environmental tests, Failure, Loads (Forces), Evaluation.
Identifiers: Weatherhead brake hoses.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 109 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). INLAND MANUFACTURING DIVISION (GENERAL MOTORS CORPORATION).
Compliance test rept.
Ogden Technology Labs., Monterey Park, Calif.

Oct 70, 33p* DOT-HS-610 325
Contract FH-11-7255

Descriptors: (*Passenger vehicles, *Safety), (*Hoses, Hydraulic brakes), Standards, Environmental tests, Failure, Loads (Forces), Evaluation.
Identifiers: Inland brake hoses.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 110 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). INLAND MANUFACTURING DIVISION (GENERAL MOTORS CORPORATION).
Compliance test rept.
Ogden Technology Labs., Inc., Monterey Park, Calif.

Oct 70, 33p* DOT-HS-610 329
Contract FH-11-7255

Descriptors: (*Passenger vehicles, *Safety), (*Hoses, Hydraulic brakes), Standards, Environmental tests, Failure, Loads (Forces), Evaluation.
Identifiers: Inland brake hoses.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 111 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). INLAND MANUFACTURING DIVISION (GENERAL MOTORS CORPORATION).
Compliance test rept.
Ogden Technology Labs., Inc., Monterey Park, Calif.

Oct 70, 31p* DOT-HS-610 331
Contract FH-11-7255

Descriptors: (*Passenger vehicles, *Safety), (*Hoses, Hydraulic brakes), Standards, Environmental tests, Failure, Loads (Forces), Evaluation.
Identifiers: Inland brake hoses.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 112 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). INLAND MANUFACTURING DIVISION (GENERAL MOTORS CORPORATION).
Compliance test rept.
Ogden Technology Labs., Inc., Monterey Park, Calif.

Oct 70, 33p* DOT-HS-610 332
Contract FH-11-7255

Descriptors: (*Passenger vehicles, *Safety), (*Hoses, Hydraulic brakes), Standards, Environmental tests, Failure, Loads (Forces), Evaluation.
Identifiers: Inland brake hoses.

The report pertains to test conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 113 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). WAGNER ELECTRIC CORPORATION.
Compliance test rept.,
Detroit Testing Lab., Mich.
Caulton Ray, Jr. Oct 70, 43p* DOT-HS-610 337
Contract FH-11-7326

Descriptors: (*Passenger vehicles, *Safety), (*Hydraulic fluids, Evaluation), (*Brake fluids, Evaluation) Hydraulic brakes, Standards, Compatibility, Corrosion, Boiling points, Environmental tests.
Identifiers: Wagner Electric brake fluids.

The report contains data and results of tests performed on one type of automotive hydraulic brake fluid 70R1 - in accordance with Federal Motor Vehicle Safety Standard No. 116. The brake fluid was tested for: boiling point, flash point, viscosity, pH, fluid stability, corrosion, fluidity and appearance at low temperature, evaporation, water tolerance, compatibility, resistance to oxidation, effect on rubber and simulated service performance. (Author)
PB-195 114 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). BOWES SEAL FAST CORP.
Compliance test rept.,
Detroit Testing Lab., Mich.
Caulton Ray, Jr. Oct 70, 43p* DOT-HS-610 334
Contract FH-11-7326

Descriptors: (*Passenger vehicles, *Safety), (*Hydraulic fluids, Evaluation), (*Brake fluids, Evaluation), Hydraulic brakes, Standards, Compatibility, Corrosion, Boiling points, Environmental tests.
Identifiers: Bowes Seal Fast brake fluids.

The report contains data and results of tests performed on one type of automotive hydraulic brake fluid 70R3 - in accordance with Federal Motor Vehicle Safety Standard No. 116. The brake fluid was tested for: boiling point, flash point, viscosity, pH, fluid stability, corrosion, fluidity and appearance at low temperature, evaporation, water tolerance, compatibility, resistance to oxidation, effect on rubber and simulated service performance. (Author)
PB-195 115 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). FAR BEST CORPORATION.
Compliance test rept.,
Detroit Testing Lab., Mich.
Caulton Ray, Jr. Oct 70, 43p* DOT-HS-610 345
Contract FH-11-7326

Descriptors: (*Passenger vehicles, *Safety), (*Hydraulic fluids, Evaluation), (*Brake fluids, Evaluation), Hydraulic brakes, Standards, Compatibility, Corrosion, Boiling points, Environmental tests.
Identifiers: Far Best brake fluids.

The report contains data and results of tests performed on one type of automotive hydraulic brake fluid 70R1 - in accordance with Federal Motor Vehicle Safety Standard No. 116. The brake fluid was tested for: boiling point, flash point, viscosity, pH, fluid stability, corrosion, fluidity and appearance at low temperature, evaporation, water tolerance, compatibility, resistance to oxidation, effect on rubber and simulated service performance. (Author)
PB-195 116 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT). GENERAL MOTORS CORPORATION.
Compliance test rept.
Electrical Testing Labs., Inc., New York.

Oct 70, 11p* DOT-HS-610 355

Descriptors: (*Lamps, Evaluation), (*Vehicles, *Safety), (*Markers, Lamps), Standards, Lenses, Colors (Materials), Corrosion tests, Vibration tests, Moisture, Dust.
Identifiers: Side marker lamps, Buick La Sabre automobiles.

The report contains the results of examination and test of 'GUIDE 45 SAE PI 69' rear side marker lamp to demonstrate compliance with the applicable requirements of the Federal Motor Vehicle Safety Standard 108. (Author)
PB-195 117 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT). GENERAL MOTORS CORPORATION.
Compliance test rept.
Electrical Testing Labs., Inc., New York.

Oct 70, 11p* DOT-HS-610 356

Descriptors: (*Lamps, Evaluation), (*Vehicles, *Safety), (*Signal lights, Evaluation), (*Identification lights, Evaluation), Standards, Lenses, Colors (Materials), Corrosion tests, Vibration tests, Moisture, Dust.
Identifiers: Turn signal lamps, Parking lamps, Chevrolet Nova automobiles.

The report contains the results of examination and test of 'GUIDE 11 SAE IP 70' front class A turn signal and parking lamp to demonstrate compliance with the applicable requirements of the Federal Motor Vehicle Safety Standard 108. (Author)
PB-195 118 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT). GENERAL MOTORS CORPORATION.
Compliance test rept.
Electrical Testing Labs., Inc., New York.

Oct 70, 10p* DOT-HS-610 358

Descriptors: (*Lamps, Evaluation), (*Vehicles, *Safety), (*Signal lights, Evaluation), (*Identification lights, Evaluation), Standards, Lenses, Colors (Materials), Corrosion tests, Vibration tests, Moisture, Dust.
Identifiers: Turn signal lamps, Parking lamps, Chevrolet Caprice automobiles.

The report contains the results of examination and test of 'GUIDE 15 SAE IP 70' front class A turn signal and parking lamp to demonstrate compliance with the applicable requirements of the Federal Motor Vehicle Safety Standard 108. (Author)
PB-195 119 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT). GENERAL MOTORS CORPORATION.
Compliance test rept.
Electrical Testing Labs., Inc., New York.

Oct 70, 9p* DOT-HS-610 361

Descriptors: (*Lamps, Evaluation), (*Vehicles, *Safety), (*Headlamps, Housings), Standards, Corrosion tests, Vibration tests.

The report contains the results of examination and test of 'GUIDE 33 SAE H 70' dual sealed beam headlamp housing to demonstrate compliance with the applicable requirements of the Federal Motor Vehicle Safety Standard 108. (Author)
PB-195 120 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT) GENERAL MOTORS CORPORATION.
Compliance test rept.
Electrical Testing Labs., New York.
Oct 70, 11p* DOT-HS-610 357

Descriptors: (*Lamps, Evaluation), (*Vehicles, *Safety), (*Markers, Lamps), (*Reflectors, Evaluation), Standards, Lenses, Colors (Materials), Corrosion tests, Vibration tests, Moisture, Dust.
Identifiers: Side marker lamps.

The report contains the results of examination and test of 'Guide 13A SAE PIA 70' rear side marker lamp and reflex reflector to demonstrate compliance with the applicable requirements of the Federal Motor Vehicle Safety Standard 108. (Author)
PB-195 121 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT) GENERAL MOTORS CORPORATION.
Compliance test rept.
Electrical Testing Labs., Inc., New York.

Oct 70, 12p* DOT-HS-610 359

Descriptors: (*Lamps, Evaluation), (*Vehicles, *Safety), (*Markers, Lamps), (*Reflectors, Evaluation), Standards, Lenses, Colors (Materials), Corrosion tests, Vibration tests, Moisture, Dust.
Identifiers: Side marker lamps, Chevrolet Bel-Air automobiles.

The report contains the results of examination and test of 'Guide 15A SAE PIA 70' rear side marker lamp and class A reflex reflector to demonstrate compliance with the applicable requirements of the Federal Motor Vehicle Safety Standard 108. (Author)
PB-195 122 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT) GENERAL MOTORS CORPORATION.
Compliance test rept.
Electrical Testing Labs., Inc., New York.

Oct 70, 11p* DOT-HS-610 362

Descriptors: (*Lamps, Evaluation), (*Vehicles, *Safety), Licenses, Standards, Lenses, Colors (Materials), Corrosion tests, Vibration tests, Moisture, Dust.
Identifiers: License plate lamps, Oldsmobile F-85 automobiles.

The report contains the results of examination and test of 'GUIDE 35 SAE L 66' license plate lamp with 'GUIDE 3 SAE L67' housing to demonstrate compliance with the applicable requirements of the Federal Motor Vehicle Safety Standard 108. (Author)
PB-195 123 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT). GENERAL MOTORS CORPORATION.
Compliance test rept.
Electrical Testing Labs., Inc., New York.

Oct 70, 11p* DOT-HS-610 363

Descriptors: (*Lamps, Evaluation), (*Vehicles, *Safety), Licenses, Standards, Lenses, Colors (Materials), Corrosion tests, Vibration tests, Moisture, Dust.
Identifiers: License plate lamps, Chevelle automobiles.

The report contains the results of examination and test of 'GUIDE 1T SAE L 67' license plate lamp with 'GUIDE 11 SAE L 66' body to demonstrate compliance with the applicable requirements of the Federal Motor Vehicle Safety Standard 108. (Author)
PB-195 124 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT). GENERAL MOTORS CORPORATION.
Compliance test rept.
Electrical Testing Labs., Inc., New York.

Oct 70, 11p* DOT-HS-610 364

Descriptors: (*Lamps, Evaluation), (*Vehicles, *Safety), (*Lighting equipment, Evaluation), Standards, Lenses, Colors (Materials), Corrosion tests, Vibration tests, Moisture, Dust.
Identifiers: Backup lamps, Chevrolet Bel-Air automobiles.

The report contains the results of examination and test of 'Guide 16S SAE R 69' backup lamp to demonstrate compliance with the applicable requirements of the Federal Motor Vehicle Safety Standard 108. (Author)
PB-195 125 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). CONTINENTAL GUMMI WERKE A.G. (GERMANY).
Compliance test rept.
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.

Oct 70, 12p* DOT-HS-610 365

Descriptors: (*Automobile tires, Evaluation), (*Tires, Tests), (*Safety, Tires), Visual inspection, Environmental tests, Failure, Wear resistance, Standards, Passenger vehicles, Loads (Forces).
Identifiers: Failure analysis, continental6 tires.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. Tests were made on the following tire manufactured by continental Gummi Werke A.G. (Germany). Continental Schlauchlos 700-14. (DOT abstract)
PB-195 126 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). THE MOHAWK RUBBER COMPANY.
Compliance test rept.
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.

Oct 70, 12p* DOT-HS-610 371

Descriptors: (*Automobile tires, Evaluation), (*Tires, Tests), (*Safety, Tires), Visual inspection, Environmental tests, Failure, Wear resistance, Standards, Passenger vehicles, Loads (Forces).
Identifiers: Failure analysis, Mohawk tires.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. Tests were made on the following tire manufactured by The Mohawk Rubber Company: Mohawk Storm Trac 775-14. (DOT abstract)
PB-195 127 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). THE GOODYEAR TIRE AND RUBBER COMPANY.
Compliance test rept.
Automotive Research Associates, Inc., San Antonio, Tex.

Oct 70, 67p* DOT-HS-610 369

Descriptors: (*Automobile tires, Evaluation), (*Tires, Tests), (*Safety, Tires), Visual inspection, Environmental tests, Failure, Wear resistance, Standards, Passenger vehicles, Loads (Forces).
Identifiers: Failure analysis, Goodyear tires.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. Tests were made on the following tires manufactured by The Goodyear Tire and Rubber Company: Goodyear Custom Wide Tread Polyglas H70-14; Goodyear Custom Radial Ply 175R-14; Goodyear Custom Wide Tread Polyglas H70-14; Goodyear Power Cushion 775-14 and E70-14; Goodyear Suburbanite 735-14; Goodyear Custom Wide Tread Polyglas F70-14. (DOT abstract)
PB-195 128 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). THE MOHAWK RUBBER COMPANY.
Compliance test rept.
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.

Oct 70, 12p* DOT-HS-610 371

Descriptors: (*Automobile tires, Evaluation), (*Tires, Tests), (*Safety, Tires), Visual inspection, Environmental tests, Failure, Wear resistance, Standards, Passenger vehicles, Loads (Forces).
Identifiers: Failure analysis, Mohawk tires.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. Tests were made on the following tire manufactured by The Mohawk Rubber Company: Mohawk Storm Trac 775-14. (DOT abstract)
PB-195 129 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). N. V. NEDERLANDSCH - AMERIKAANSCHE AUTOBANDENFABRIEK, VREDESTEIN (NETHERLANDS).
Compliance test rept.
Brown (Dayton T.), Inc., Bohemia, N.Y.Testing Labs. Div.

Oct 70, 12p* DOT-HS-610 374

Descriptors: (*Automobile tires, Evaluation), (*Tires, Tests), (*Safety, Tires), Visual inspection, Environmental tests, Failure, Wear resistance, Standards, Passenger vehicles, Loads (Forces).
Identifiers: Failure analysis, Vredestein tires.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. Tests were made on the following tire manufactured by N.V. Nederlandsch - Amerikaansche Autobandenfabriek, Vredestein (Netherlands): Vredestein V-83 590-14. (DOT abstract)
PB-195 130 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). THE ARMSTRONG RUBBER COMPANY.
Compliance test rept.
Compliance Testing, Inc., Ravenna, Ohio.

Oct 70, 40p* DOT-HS-610 375

Descriptors: (*Automobile tires, Evaluation), (*Tires, Tests), (*Safety, Tires), Visual inspection, Environmental tests, Failure, Wear resistance, Standards, Passenger vehicles, Loads (Forces).
Identifiers: Failure analysis, Armstrong tires, Buccaneer tires, Admiral tires.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. Tests were made on the following tires manufactured by Armstrong Rubber Co.: Armstrong Super HPG H78-14; Armstrong Premium Coronet 73-14 and 825-14; Armstrong Super HPG G78-14; Armstrong Premium Sportway 560-14; Armstrong Golden Signet F78-14; Buccaneer Puncture Sealant Premium 855-14; Admiral F78-15. (DOT abstract)
PB-195 131 HC$3.00 MF$0.65

REFLECTOR ANALYSIS,
Century Research Corp., Arlington, Va.
For primary bibliographic entry see Field 13L.
PB-195 176 HC$3.00 MF$0.65

A MATHEMATICAL MODEL FOR EVALUATING PRIORITY LANE OPERATIONS ON FREEWAYS.
Final rept.,
California Univ., Berkeley. Inst. of Transportation and Traffic Engineering.
G. A. Sparks, and A. D. May. Jun 70, 153p*
Contract FH-11-7186

Descriptors: (*Freeways, *Traffic control), (*Traffic engineering, *Divided highways), (*Passenger vehicles, Selectivity), Buses (Vehicles), Automobiles, Mathematical models, Computer programs, Passenger transportation, Queueing theory, Time, Demand (Economics), Optimization.
Identifiers: Reserved highway lanes, High occupancy vehicles, Computer models, Priorities.

A mathematical model and a computer program have been developed to evaluate priority lane operations on freeways (reserving one or more lanes for buses and high occupancy vehicles). The total passenger time expended under normal lane operations is compared with total passenger time expended under priority operations. The model has been developed to handle various conditions such as: queuing and nonqueuing situations, varying the number of reserved lanes, varying the occupancy of vehicles permitted to use reserved lanes, varying the distribution of vehicle occupancies, etc. In addition, the study investigated a possible means of relating shifts in occupancy and changes in modal split to various priority lane operation strategies in an attempt to determine the optimum use of lanes. (BPR abstract)
PB-195 177 HC$3.00 MF$0.65

TRAFFIC SYSTEMS REVIEWS AND ABSTRACTS. TRAFFIC FLOW THEORY. COMMUNICATION AND CONTROL SYSTEMS. COST EFFECTIVENESS METHODOLOGY. ISSUE NUMBER 38. REVIEWS: T-1111-T-1140.
Research Triangle Inst., Durham, N.C.

Oct 70, 45p
Contract FH-11-6610
See also Issue no. 37, PB-194 707

Descriptors: (*Traffic engineering, Reviews), Automatic control, Braking, Statistical analysis, Man machine systems, Ramps, Human behavior, Safety engineering, Motor vehicle accidents, Intersections, Mathematical models, Traffic signals, Computerized simulation, Motor noise, Velocity, Abstracts.
Identifiers: Traffic flow theory, Field studies, Gap acceptance, Lane changing, Driver vehicle interactions.

The publication is an assembly of traffic systems reviews and abstracts. The main objective of this technical review service is to furnish critical reviews and abstracts of current literature in the topic areas of traffic flow theory, communication and control systems, and cost effectiveness methodology. BPR abstract)
PB-195 189 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 202 (HEAD RESTRAINTS). CHRYSLER CORPORATION 1970 DODGE CORONET.
Compliance test rept.
General Testing Labs., Inc., Springfield, Va.

Sep 70, 19p* DOT-HS-610 297
Contract FH-11-7197

Descriptors: (*Passenger vehicles, *Safety), (*Seats, Human factors engineering), Standards, Head (Anatomy), Loads (Forces), Environmental tests, Evaluation.

Identifiers: *Head restraints (Vehicles), Dodge Coronet automobiles.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 202 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). THE ARMSTRONG RUBBER COMPANY.
Compliance test rept.
Ogden Technology Labs., Inc., Monterey Park, Calif.

Sep 70, 16p* DOT-HS-610 298

Descriptors: (*Automobile tires, Evaluation), (*Tires, Tests), (*Safety, Tires), Visual inspection, Environmental tests, Failure, Wear resistance, Standards, Passenger vehicles, Loads (Forces).
Identifiers: Failure analysis, Armstrong tires.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. Tests were made on the following tires manufactured by Armstrong Rubber Co.: Armstrong Premium Coronet 650-13 and Armstrong Golden Signet G78-15. (DOT abstract)
PB-195 203 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 105 (BRAKES). FORD MOTOR COMPANY 1970 MERCURY MONTEREY.
Compliance test rept.
Dynamic Science Phoenix, Ariz. AvSER Facility.

Sep 70, 128p* DOT-HS-610 305
Contract FH-11-7190

Descriptors: (*Brakes (Motion arresters), Evaluation), (*Passenger vehicles, *Safety), Standards, Road tests, Environmental tests, Performance.
Identifiers: *Vehicle brakes, Mercury Monterey automobiles.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 204 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). COOPER TIRE AND RUBBER COMPANY.
Compliance test rept.
Compliance Testing, Inc., Ravenna, Ohio.

Oct 70, 23p* DOT-HS-610 311

Descriptors: (*Automobile tires, Evaluation), (*Tires, Tests), (*Safety, Tires), Visual inspection, Environmental tests, Failure, Wear resistance, Standards, Passenger vehicles, Loads (Forces).
Identifiers: Failure analysis, Cooper tires, Hercules tires, Falls tires.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. Tests were made on the following tires manufactured by Cooper Tire and Rubber Co: Hercules Wide Belt 70 H70-15; Cooper Super Jet Sport G70-14; Falls Premium 78 E78-14 and F78-14. (DOT abstract)
PB-195 205 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). DENMAN RUBBER MANUFACTURING COMPANY.
Compliance test rept.
Compliance Testing, Inc., Ravenna, Ohio.

Oct 70, 15p* DOT-HS-610 312

Descriptors: (*Automobile tires, Evaluation), (*Tires, Tests), (*Safety, Tires), Visual inspection, Environmental tests, Failure, Wear resistance, Standards, Passenger vehicles, Loads (Forces).
Identifiers: Failure analysis, Denman tires.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. Tests were made on the following tires manufactured by Denman Rubber Manufacturing Co: Denman Twin Belt DT 220 H78-14, J78-15, and H78-15. (DOT abstract)
PB-195 206 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). THE FIRESTONE TIRE AND RUBBER COMPANY.
Compliance test rept.
Compliance Testing, Inc., Ravenna, Ohio.

Oct 70, 31p* DOT-HS-610 313

Descriptors: (*Automobile tires, Evaluation), (*Tires, Tests), (*Safety, Tires), Visual inspection, Environmental tests, Failure, Wear resistance, Standards, Passenger vehicles, Loads (Forces).
Identifiers: Failure analysis, Firestone tires, Riverside tires.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. Tests were made on the following tires manufactured by Firestone Tire and Rubber Co.: Firestone SS Deluxe Champion 650-13, 735-14, and 775-14; Firestone Super Sport Wide Oval E70-14 and H70-15; Firestone SS Deluxe Chamption 855-14; Riverside Glasbelt 775-14. (DOT abstract)
PB-195 207 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). THE WEATHERHEAD COMPANY.
Compliance test rept.
Ogden Technology Labs., Inc., Monterey Park, Calif.

Oct 70, 33p* DOT-HS-610 316
Contract FH-11-7255

Descriptors: (*Passenger vehicles, *Safety), (*Hoses, Hydraulic brakes), Standards, Environmental tests, Failure, Loads (Forces), Evaluation.
Identifiers: Weatherhead brake hoses.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 208 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). THE FIRESTONE TIRE AND RUBBER COMPANY.
Compliance test rept.
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.

Oct 70, 27p* DOT-HS-610 367
Contract FH-11-7184

Descriptors: (*Automobile tires, Evaluation), (*Tires, Tests), (*Safety, Tires), Visual inspection, Environmental tests, Failure, Wear resistance, Standards, Passenger vehicles, Loads (Forces).
Identifiers: Failure analysis, Firestone tires.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. Tests were made on the following tire manufactured by The Firestone Tire and Rubber Company: Firestone Deluxe Champion Sup-R-Belt F78-14. (DOT abstract)
PB-195 209 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). THE GATES RUBBER COMPANY.
Compliance test rept.
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.

Oct 70, 12p* DOT-HS-610 368
Contract FH-11-7184

Descriptors: (*Automobile tires, Evaluation), (*Tires, Tests), (*Safety, Tires), Visual inspection, Environmental tests, Failure, Wear resistance, Standards, Passenger vehicles, Loads (Forces).
Identifiers: Failure analysis, Gates tires, Davis tires.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. Tests were made on the following tire manufactured by The Gates Rubber Company: Davis The Wide One G70-15. (DOT abstract)
PB-195 210 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). KELLY-SPRIN(FIELD TIRE COMPANY.
Compliance test rept.
General Testing Labs., Hartwood, Va. Vehicular Lab.

Oct 70, 19p* DOT-HS-610 370

Descriptors: (*Automobile tires, Evaluation), (*Tires, Tests), (*Safety, Tires), Visual inspection, Environmental tests, Failure, Wear resistance, Standards, Passenger vehicles, Loads (Forces).
Identifiers: Failure analysis, Kelly Springfield tires, Atlas tires, OK tires.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. Tests were made on the following tire manufactured by The Kelly-Springfield Tire Company: Atlas Mile-Pak 775-14; O.K. Tire Starflite 855-14. (DOT abstract)
PB-195 211 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). PIRELLI S. P. A. (ITALY).
Compliance test rept.
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.

Oct 70, 19p* DOT-HS-610 372
Contract FH-11-7184

Descriptors: (*Automobile tires, Evaluation), (*Tires, Tests), (*Safety, Tires), Visual inspection, Environmental tests, Failure, Wear resistance, Standards, Passenger vehicles, Loads (Forces).
Identifiers: Failure analysis, Pirelli tires.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. Tests were made on the following tires manufactured by Pirelli S.P.A. (Italy): Pirelli Cinturato H 185HR-13 and 225HR-14. (DOT abstract)
PB-195 212 HC$3.00 MF$0.65

DOOR LOCKING SYSTEMS STUDY.
Final rept. on phase 1.
American Machine and Foundry Co., Santa Barbara, Calif. Advanced Systems Lab.

22 Jan 68, 157p* AMF-ASL-E-153-1020-1 HS-800 242
Contract FH-11-6576

Descriptors: (*Doors, Locks (Fasteners)), (*Locks (Fasteners), *Performance standards), (*Motor vehicles, *Safety), Design standards, Failure, Management planning, Classifications.

Phase I of the door locking system study was concerned with the planning for the development of minimum safety performance standards. In order to provide a firm basis for the planning, several exploratory tasks were accomplished. A data base matrix was synethesized. A threat model was formulated. A locking system classification was established. Locking system failure modes were defined. A data acquisition system was established and exercised on a trial basis. An analytical model for the general case of failure response determination was defined. Plans for a criteria model and a priority matrix were developed. (Author)
PB-195 222 HC$3.00 MF$0.65

STUDY OF BUS SIDE WINDOWS,
All American Engineering Co., Wilmington, Del.
Clarence P. Raezer. 2 Nov 70, 84p* M-1233 DOT-HS-800 303
Contract FH-11-6888

Descriptors: (*Window glass, *Safety), (*Buses, Windows), Laminated glass, Heat treated glass, Safety devices, Escape systems, Mechanical shock, Impact strength, Failure, Statistical data, Quick release fasteners.

The purpose of the study was to investigate bus side windows relative to occupant ejection, retention or escape during and/or after a crash involving the vehicle. A testing device simulating the head area of the bus occupant impacting the bus side window and/or the retaining structure was used to test various types of bus side window sample configurations. The results of the testing indicated that, in general, the emergency push-out type windows and certain fixed windows would not retain the bus occupant in the event of a crash and thus subject the occupant to possible injuries more serious than if retention within the vehicle had been realized. It was concluded that the friction latches presently used on the push-out windows are inadequate and that such a latch, if physically able to retain an occupant during a crash, would be too difficult for the occupant to force open during an emergency situation. It was concluded that in the event of an accident which would cause the occupant to impact the side windows that the fixed window structures, in general, are also inadequate to retain bus occupants. (Author)
PB-195 231 HC$3.00 MF$0.65

MULTIDISCIPLINARY ACCIDENT INVESTIGATION CASE NO. 1164D. HEADON COLLISION.
California Univ., Los Angeles. UCLA Trauma Research Group.
For primary bibliographic entry see Field 13L.
PB-195 232 HC$3.00 MF$0.65

MULTIDISCIPLINARY ACCIDENT INVESTIGATION CASE NO.1266D. CAR, ROLLOVER/FIXED OBJECT IMPACT.
California Univ., Los Angeles. UCLA Trauma Research Group.
For primary bibliographic entry see Field 13L.
PB-195 233 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 202 (HEAD RESTRAINTS). FORD MOTOR COMPANY 1970 MERCURY MONTEGO.
Compliance test rept.
General Testing Labs., Inc., Springfield, Va.
Sep 70, 19p* DOT-HS-610 296

Descriptors: (*Passenger vehicles, *Safety), (*Seats, Human factors engineering), Standards, Head (Anatomy), Loads (Forces), Environmental tests, Evaluation.
Identifiers: *Head restraints (Vehicles), Mercury Montego automobiles.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 234 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). THE DAYTON TIRE AND RUBBER COMPANY.
Compliance test rept.
Ogden Technology Labs., Inc., Deer Park, N.Y. Test Lab.

Sep 70, 20p* DOT-HS-610 299

Descriptors: (*Automobile tires, Evaluation), (*Tires, Tests), (*Safety, Tires), Visual inspection, Environmental tests, Failure, Wear resistance, Standards, Passenger vehicles, Loads (Forces).
Identifiers: Failure analysis, Dayton tires, Road King tires, McClaren tires.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. Tests were made on the following tires manufactured by Dayton Tire and Rubber Co.: Road King Traction Plus G78-15; McClaren Sport Premium 560-13 and 560-14. (DOT abstract)
PB-195 235 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). THE GOODYEAR TIRE AND RUBBER COMPANY.
Compliance test rept.
Ogden Technology Labs., Inc., Deer Park, N.Y. Test Lab.

Sep 70, 20p* DOT-HS-610 300

Descriptors: (*Automobile tires, Evaluation), (*Tires, Tests), (*Safety, Tires), Visual inspection, Environmental tests, Failure, Wear resistance, Standards, Passenger vehicles, Loads (Forces).
Identifiers: Failure analysis, Goodyear tires.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. Tests were made on the following tires manufactured by Goodyear Tire and Rubber Co.: Goodyear Sure Grip 825-14 and 775-14; Goodyear Power Cushion H78-14. (DOT abstract)
PB-195 236 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). LEE TIRE AND RUBBER COMPANY.
Compliance test rept.
Ogden Technology Labs., Inc., Deer Park, N.Y. Test Lab.

Sep 70, 8p* DOT-HS-610 302

Descriptors: (*Automobile tires, Evaluation), (*Tires, Tests), (*Safety, Tires), Visual inspection, Environmental tests, Failure, Wear resistance, Standards, Passenger vehicles, Loads (Forces).
Identifiers: Failure analysis, Lee tires, Concorde tires.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. Tests were made on the following tire manufactured by Lee Tire and Rubber Company: Concorde XL 200 775-15. (DOT abstract)
PB-195 237 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). MANSFIELD TIRE AND RUBBER COMPNAY.
Compliance test rept.
General Testing Labs., Inc., Springfield, Va.

Sep 70, 8p* DOT-HS-610 303

Descriptors: (*Automobile tires, Evaluation), (*Tires, Tests), (*Safety, Tires), Visual inspection, Environmental tests, Failure, Wear resistance, Standards, Passenger vehicles, Loads (Forces).
Identifiers: Failure analysis, Mansfield tires, Harvard tires.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. Tests were made on the following tires manufactured by Mansfield Tire and Rubber Co.: Harvard Nobel Custom Belted fF78-15. (DOT abstract)
PB-195 238 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 105 (BRAKES). BRITISH LEYLAND MOTORS 1970 AUSTIN AMERICA.
Compliance test rept.
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.

Sep 70, 103p* DOT-HS-610 306
Contract FH-11-7184

Descriptors: (*Brakes (Motion arresters), Evaluation), (*Passenger vehicles, *Safety), Standards, Road tests, Environmental tests, Performance.

Identifiers: *Vehicle brakes, Austin America automobiles.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 239 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 105 (BRAKES). GENERAL MOTORS CORPORATION 1970 PONTIAC TEMPEST.
Compliance test rept.,
Detroit Testing Lab., Mich.
William J. Eubank. Sep 70, 110p* DOT-HS-610 307

Descriptors: (*Brakes (Motion arresters), Evaluation), (*Passenger vehicles, *Safety), Standards, Road tests, Environmental tests, Performance.
Identifiers: *Vehicle brakes, Pontiac Tempest automobiles.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 240 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 202 (HEAD RESTRAINTS). FORD MOTOR COMPANY 1970 THUNDERBIRD.
Compliance test rept.
General Testing Labs., Inc., Springfield, Va.

Sep 70, 19p* DOT-HS-610 308

Descriptors: (*Passenger vehicles, *Safety), (*Seats, Human factors engineering), Standards, Head (Anatomy), Loads (Forces), Environmental tests, Evaluation.
Identifiers: *Head restraints (Vehicles), Ford Thunderbird automobiles.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 241 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). THE ARMSTRONG RUBBER COMPANY.
Compliance test rept.
General Testing Labs., Inc., Springfield, Va.

Oct 70, 11p* DOT-HS-610 310

Descriptors: (*Automobile tires, Evaluation), (*Tires, Tests), (*Safety, Tires), Visual inspection, Environmental tests, Failure, Wear resistance, Standards, Passenger vehicles, Loads (Forces).
Identifiers: Failure analysis, Armstrong tires, Super Test tires.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. Tests were made on the following tires manufactured by Armstrong Rubber Co.: Super Test Cougar SST F78-14 and H78-14. (DOT abstract)
PB-195 242 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). LOCKHEED (ENGLAND).
Compliance test rept.,
Detroit Testing Lab., Mich.
William J. Eubank. Oct 70, 32p DOT-HS-610 314

Descriptors: (*Passenger vehicles, *Safety), (*Hoses, Hydraulic brakes), Standards, Environmental tests, Failure, Loads (Forces), Evaluation.
Identifiers: Lockheed brake hoses.

The report contains the results of tests performed in accordance with Federal Motor Vehicle Safety Standard No. 106 on one (1) set of thirteen (13) 1/8 inch I.D. automotive hydraulic brake hoses. The hoses, manufactured by Lockheed Ate, were tested for constriction, expansion, bursting strength, tensile strength, cold bend and salt spray corrosion resistance. (Author)
PB-195 243 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). THE WEATHERHEAD COMPANY.
Compliance test rept.,
Detroit Testing Lab., Mich.
William J. Eubank. Oct 70, 32p* DOT-HS-610 315

Descriptors: (*Passenger vehicles, *Safety), (*Hoses, Hydraulic brakes), Standards, Environmental tests, Failure, Loads (Forces), Evaluation.
Identifiers: Weatherhead brake hoses.

The report contains the test data, results and conclusions of tests performed on one set of thirteen (13) 1/8 inch I.D. automotive hydraulic brake hoses for compliance to Federal Motor Vehicle Safety Standard No. 106. The hoses, Part No. 153-55118, manufactured by The Weatherhead Company, were tested for constriction, expansion, bursting strength, fatigue life, tensile strength, cold bend and salt spray corrosion resistance. (Author)
PB-195 244 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). THE WEATHERHEAD COMPANY.
Compliance test rept.
Ogden Technology Labs., Inc., Deer Park, N.Y. Test Lab.

Oct 70, 33p* DOT-HS-610 317
Contract FH-11-7255

Descriptors: (*Passenger vehicles, *Safety), (*Hoses, Hydraulic brakes), Standards, Environmental tests, Failure, Loads (Forces), Evaluation.
Identifiers: Weatherhead brake hoses.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 245 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). THE WEATHERHEAD COMPANY.
Compliance test rept.
Ogden Technology Labs., Inc., Deer Park, N.Y. Test Lab.

Oct 70, 33p* DOT-HS-610 318
Contract FH-11-7255

Descriptors: (*Passenger vehicles, *Safety), (*Hoses, Hydraulic brakes), Standards, Environmental tests, Failure, Loads (Forces), Evaluation.
Identifiers: Weatherhead brake hoses.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 246 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). THE WEATHERHEAD COMPANY.
Compliance test rept.
Ogden Technology Labs., Inc., Deer Park, N.Y. Test Lab.

Oct 70, 33p* DOT-HS-610 319
Contract FH-11-7255

Descriptors: (*Passenger vehicles, *Safety), (*Hoses, Hydraulic brakes), Standards, Environmental tests, Failure, Loads (Forces), Evaluation.
Identifiers: Weatherhead brake hoses.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 247 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). THE WEATHERHEAD COMPANY.
Compliance test rept.
Ogden Technology Labs., Inc., Deer Park, N.Y. Test Lab.

Oct 70, 34p* DOT-HS-610 320
Contract FH-11-7255

Descriptors: (*Passenger vehicles, *Safety), (*Hoses, Hydraulic brakes), Standards, Environmental tests, Failure, Loads (Forces), Evaluation.
Identifiers: Weatherhead brake hoses.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 248 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). THE WEATHERHEAD COMPANY.
Compliance test rept.
Ogden Technology Labs., Inc., Deer Park N.Y. Test Lab.

Oct 70, 33p* DOT-HS-610 321
Contract FH-11-7255

Descriptors: (*Passenger vehicles, *Safety), (*Hoses, Hydraulic brakes), Standards, Environmental tests, Failure, Loads (Forces), Evaluation.
Identifiers: Weatherhead brake hoses.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 249 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 105 (BRAKES). BRITISH LEYLAND MOTORS.
Compliance test rept.,
Detroit Testing Lab., Mich.
William J. Eubank. Oct 70, 124p* DOT-HS-610 341

Descriptors: (*Brakes (Motion arresters), Evaluation), (*Passenger vehicles, *Safety), Standards, Road tests, Environmental tests, Performance.
Identifiers: *Vehicle brakes, Triumph GT 6+ automobiles.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)
PB-195 250 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). UNIROYAL, INCORPORATED.
Compliance test rept.
Ogden Technology Labs., Inc., Deer Park, N.Y. Test Lab.

Oct 70, 21p* DOT-HS-610 373

Descriptors: (*Automobile tires, Evaluation), (*Tires, Tests), (*Safety, Tires), Visual inspection, Environmental tests, Failure, Wear resistance, Standards, Passenger vehicles, Loads (Forces).
Identifiers: Failure analysis, Uniroyal tires.

The report pertains to tests conducted by an independent contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. Tests were made on the following tires manufactured by Uniroyal Incorporated: Uniroyal Radial Ply Max 195R-14; Uniroyal Laredo Super Low Profile 825-14. (DOT abstract)
PB-195 251 HC$3.00 MF$0.65

13G. Hydraulic and Pneumatic Equipment

COMPUTER PROGRAM FOR PREDICTION OF AXIAL FLOW TURBINE PERFORMANCE.
Technical rept.,
Naval Postgraduate School Monterey Calif
Ennio Macchi. Aug 70, 104p Rept no. NPS-57MA70081A

Descriptors: (*Axial-flow turbines, Performance (Engineering)), Computer programs, Equations of motion, Thermodynamics, Boundary layer, Correlation techniques, Predictions.

The report presents a computer program for prediction of performance of single-stage axial turbines of given geometry. The three-dimensional method developed by Vavra is applied, taking account of streamline curvatures and slopes, as well as enthalpy and entropy gradients in the solutions of the equation of motion, and of boundary layer thicknesses in the continuity equation. A choice among five different loss correlation methods and two flow angles correlations is offered. Loss coefficients and flow angles are automatically calculated from blading geometry and actual flow conditions for every streamline, according to the selected correlation method. (Author)
AD-713 116 HC$3.00 MF$0.65

AN INVESTIGATION OF THE DYNAMIC PRESSURE ESPONSE OF FLUERIC TRANSMISSION LINES,
Army Advanced Ballistic Missile Defense Agency Huntsville Ala
Larry C. Atha. 1970, 14p

Descriptors: (*Fluidics, Transmission lines), Mathematical models, Design, Systems engineering, Pressure, Response.

The scope of the investigation can be summarized in three parts: (1) An examination and review of pertinent literature; (2) The development of a mathematical model of a flueric transmission line wuitable for use by a design engineer; and (3) The experimental determination of the dynamic response of flueric transmission lines over a wide frequency range with subsequent verification of the mathematical model. (Author)
AD-713 505 HC$3.00 MF$0.65

A FLUERIC OSCILLATOR FOR MILITARY TIMER APPLICATIONS,
Harry Diamond Labs Washington D C
Carl J. Campagnuolo, and Stacy E. Gehman. 1970, 13p*

Descriptors: (*Fluidics, Oscillators), (*Timing devices, Fluidics), Feasibility studies, Pressure, Temperature.
Identifiers: *Flueric oscillators.

A flueric RC oscillator that is capable of operating over a wide range of stagnation conditions is described. This oscillator, developed primarily by experimental methods, demonstrates the feasibility of using flueric oscillators as time bases. To optimize pressure and temperature insensitivity, three geometrically similar oscillators with different resistors in the feedback network were constructed and tested. A modification of one of these oscillators had a frequency change of less than plus or minus 1 percent for pressures ranging from 6 to 30 psig and temperatures from -56 to 175F. (Author)
AD-713 514 HC$3.00 MF$0.65

THEORETICAL INVESTIGATION OF THE THREE-DIMENSIONAL STRESS DISTRIBUTION IN RADIAL FLOW COMPRESSOR WHEELS.
Theoretische Ermittlung Der Dreidimensionalen Spannungsverteilung in Radialverdichterraedern
Deutsche Forschungs- Und Versuchsanstalt Fuer Luft- Und Raumfahrt, Muelheim (West Germany).
R. Cuntze. May 70, 75p DLR-FB-70-16
Lang- in German, English Summary Spon- Sponsored By Deut. Forschungsgemeinschaft

Descriptors: *Compressor blades, *Finite element method, *Radial flow, *Rotating disks, *Stress concentration, Anisotropic plates, Centrifugal compressors, Loads (forces).

For abstract, see STAR 08 21.
N70-38484 HC$3.00 MF$0.65

13H. Industrial Processes

A GUIDE FOR ULTRASONIC TESTING AND EVALUATION OF WELD FLAWS.
Final rept.,
Naval Ordnance Lab White Oak Md
R. A. Youshaw. Aug 70, 22p Rept no. NOLTR-70-85 SSC-213
Revision of Appendix A to NOLTR-70-85, AD-709 918.

Descriptors: (*Non-destructive testing, *Welds), Standards, Ultrasonic radiation, Steel, Defects (Materials), Ship structural components.
Identifiers: *Butt welds.

The document presents procedures and acceptance limits for contract ultrasonic inspection of steel but welds in the thickness range of 1/4 to 2 inches. The acceptance limits described are compatible with those set forth in SSC-177, 'Guide for Interpretation of Nondestructive Tests of Welds in Ship Hull Structures' for radiographic inspection and should therefore result in statisfactory ship welds. (Author)
AD-713 202 HC$3.00 MF$0.65

UNTERSUCHUNGEN UBER DEN ZERFASERUNGSWIDERSTAND ABGEPRESSTER ALKALICELLULOSEBLATTER (Investigations of the Shredding Resistance of Sheets of Pressed Alkali Cellulose),
Svenska Traforskningsinstitutet Stockholm
For primary bibliographic entry see Field 11L.
AD-713 333

REGLERFORSOK MED INLOPPSLADEMODELL (Pilot Tests on Papermill Control Systems),
Svenska Traforskningsinstitutet Stockholm
Ralph Lindstrom. 26 Nov 68, 9p Rept nos.
Meddelande-27, PA-6
Text in Swedish.
Availability: Pub. in Svensk Papperstidning, v72 n15 p459-465 1969. No copies furnished.

Descriptors: (*Paper industry, Machines), Automation, Control systems, Sweden.
Identifiers: *Paper mills.

The dynamics of a paper machine aircushioned headbox are briefly described and the operational factors affecting the controllability of the process are discussed. Results are presented from frequency response analysis of different types of control systems, evaluated by means of a headbox model. (Author)
AD-713 347

MATNING AV POROSITET PA LOPANDE BANA (Measuring Porosity in the Production Line),
Svenska Traforskningsinstitutet Stockholm
For primary bibliographic entry see Field 11L.
AD-713 351

INCREASING THE LIFE OF PARTS BY SURFACE STRAIN HARDENING,
Foreign Technology Div Wright-Patterson AFB Ohio
V. F. Kucherenko. 18 Aug 70, 8p Rept no. FTD-MT-24-160-70
Edited machine trans. of Metallurgicheskaya i Gornorudnaya Promyshlennost (USSR) n6 p63-66 1968, by Robert A. Potts.

Descriptors: (*Strain hardening, Steel), Life expectancy, Sulfides, Molybdenum compounds, Wear resistance, Fatigue (Mechanics), USSR.
Identifiers: Molybdenum disulfide, Solid lubricants, Translations.

Surface work hardening of C 0.38-0.50 percent steel makes it possible not only to raise the fatigue strength but also the wear resistance of parts operating in conditions of cyclic overloading and wear. The positive effect of surface cold work is particularly significant for friction with lubricant. MoS2 applied to degreased surfaces by depressed rollers raises the wear resistance of steel parts and noticeably decreases the frictional wear in couples with bronze during friction in an oil environment. (Author)
AD-713 454 HC$3.00 MF$0.65

INVESTIGATION OF THE EFFECTIVENESS OF ULTRASONIC VIBRATIONS OF THE TOOL WHEN MACHINING HEAT-RESISTANT AND TITANIUM ALLOYS,
Foreign Technology Div Wright-Patterson AFB Ohio
M. S. Nerubai. 20 Aug 70, 12p Rept no. FTD-MT-24-162-70
Edited machine trans. of Aviatsionnyi Institut, Kuibyshev. Trudy (USSR) n18 p15-27 1963, by Robert A. Potts.

Descriptors: (*Machining, *Ultrasonic radiation), Ultrasonic properties, Heat-resistant metals + alloys, Titanium alloys, USSR, Cutting tools, Effectiveness.
Identifiers: Translations.

The study, employing forced ultrasonic radial vibrations, was carried out in a specially built set-up on maintaining a constant vibration frequency of 21 kilocycles. Analysis of the findings revealed that in this event machining is accompanied by a marked decrease in the longitudinal shrinkage factor (presence of thinner chips) as well as by the absence of burrs. Then the tool feed rate exceeds 0.4 mm/revolution, the temperature during conventional machining was the same as during machining accompanied by the application of ultrasonic vibrations, but in both cases burrs were absent. Depending on the vibration amplitude ultrasonic vibrations may raise or lower the mean temperature in the machining zone. Thus the excitation of ultrasonic vibrations of large and given medium amplitudes raises the temperature in the machining zone for VTZ-1 titanium alloy, particularly in the presence of low tool feed rates, while in the range of double amplitudes 0.003-0.006 mm it lowers the temperature by 40-60 degrees centigrade. Similar findings were made for E787 and St.45 steels. (Author)
AD-713 455 HC$3.00 MF$0.65

STRUCTURE, PROPERTIES AND RADIATION SENSITIVITY OF ELECTRICALLY BISTABLE MATERIALS.
Florida Univ Gainesville Engineering and Industrial Experiment Station
For primary bibliographic entry see Field 20L.
AD-713 483 HC$3.00 MF$0.65

THE NATURE AND FORMATION OF THE BOND IN THE EXPLOSIVE BONDING OF METALS,
Frankford Arsenal Philadelphia Pa
James F. Kowalick, and D. Robert Hay. 1968, 11p

Descriptors: (*Explosions, *Pressure welding), Bonding, Fluid flow, Shock waves.
Identifiers: *Explosive welding.

The interface between explosively-bonded metals frequently exhibits a wavelike profile which has been associated with weldments having superior mechanical properties. Previous theories were essentially qualitative, in that they described possible metal flow configurations, but did not predict conditions under which waves are either initiated or discontinued. The mechanism proposed in the paper demonstrates that the wave-formation process during metal-to-metal collisions is not a unique phenomenon, and predicts the appearance of wavelike interfaces. (Author)
AD-713 555 HC$3.00 MF$0.65

ADSORPTION-SENSITIVE MECHANICAL AND MACHINING BEHAVIOUR OF SODA-LIME GLASS.
Martin Marietta Corp Baltimore Md Research Inst for Advanced Studies
For primary bibliographic entry see Field 11B.
AD-713 594 HC$3.00 MF$0.65

ENVIRONMENT-SENSITIVE MACHINING BEHAVIOR OF NONMETALS.
Martin Marietta Corp Baltimore Md Research Inst for Advanced Studies
For primary bibliographic entry see Field 11B.
AD-713 595 HC$3.00 MF$0.65

A SHORT-RANGE DIGITAL TELEMETRY SYSTEM FOR REMOTE POSITIONING REGULATOR CONTROLLERS,
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 9F.
AD-713 616 HC$3.00 MF$0.65

PARALLEL GAP WELDING.
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
A. M. Pasciak. 9 Sep 69, 40p NASA-TM-X-53876, MSFC-IN-R-QUAL-67-6

Descriptors: *Electric welding, *Microelectronics, Electronic packaging, Gold alloys, Integrated circuits, Requirements.

For abstract, see STAR 08 21.
N70-38147 HC$3.00 MF$0.65

PREDICTION OF COAL GRINDABILITY FROM EXPLORATION DATA.
Bureau of Mines, Washington, D.C.
For primary bibliographic entry see Field 8G.
PB-194 941 HC$3.00 MF$0.65

METHODS OF MEASUREMENT FOR SEMICONDUCTOR MATERIALS, PROCESS CONTROL, AND DEVICES.
National Bureau of Standards, Washington, D.C.
For primary bibliographic entry see Field 20L.
PB-194 961 HC$0.65 MF$0.65

EVALUATION OF AN EXPERIMENTAL FISH REDUCTION PROCESS APPLICABLE TO SMALL FISHERIES.
Bureau of Commercial Fisheries, Ann Arbor, Mich.
For primary bibliographic entry see Field 6H.
PB-195 052 HC$3.00 MF$0.65

TREATMENT OF WASTE WATER-WASTE OIL MIXTURES.
Armco Steel Corp., Middletown, Ohio.
For primary bibliographic entry see Field 13B.
PB-195 161 MF$0.65

INTERNATIONAL CONFERENCE ON ELECTRON BEAM WELDING AND MELTING (1ST) - PARIS 16-18 JUNE 1970: ABSTRACTS.
Commissariat a l'Energie Atomique, Paris (France).
Jun 70, 54p

Descriptors: (*Electron beam welding, Meetings), (*Electron beam melting, Meetings), Abstracts, France.
PB-195 196 HC$3.00 MF$0.65

TREATMENT OF ACID MINE DRAINAGE BY REVERSE OSMOSIS.
Rex Chainbelt, Inc., Milwaukee, Wis.
Mar 70, 42p FWPCA-14010-DYK-03/70, W71-00477
Grant FWPCA-14010-DYK
Prepared in cooperation with the Commonwealth of Pennsylvania Department of Mines and Mineral Industries. Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $0.55 as I67.13/4: 14010DYK03/70.

Descriptors: (*Mine waters, *Osmosis), (*Water pollution, Mine waters), (*Water treatment, Mine waters), (*Demineralizing, Osmosis), Membranes, Field tests, Calcium inorganic compounds, Sulfates, Magnesium inorganic compounds, Iron inorganic compounds, Water supply.
Identifiers: *Mine acid drainage, *Reverse osmosis, *Water pollution control.

The report documents a study on the treatment of acid mine drainage by reverse osmosis. The objective of the study was to determine the feasibility of utilizing reverse osmosis to abate pollution due to acid mine drainage, and produce a water which could be used by industry or as a municipal water supply. A test site in Shickshinny, Pennsylvania was selected as a source of acid mine water for the study. A sample of this water was tested in a laboratory reverse osmosis unit to determine the design parameters for a 10,000 gallon per day demonstration unit. The results obtained during the demonstration period indicated that the reverse osmosis process has potential application in acid mine drainage treatment. A high quality water was produced which was suitable for use by industries or municipalities with a minimum of additional treatment. There are, however, operational problems which must be solved prior to utilizing reverse osmosis on a large scale. These include maintenance of high permeation rates through the membrane by reducing membrane fouling and determination of the optimum flow sheet for an acid mine treatment system utilizing reverse osmosis. (Author)
PB-195 200 MF$0.65

APPLICATION OF CLASSICAL INDUSTRIAL ENGINEERING TECHNIQUES TO SYSTEMS ENGINEERING,
Bettis Atomic Power Lab., Pittsburgh, Pa.
For primary bibliographic entry see Field 5A.
For abstract, see NSA 24 20.
WARD-T-2311 HC$3.00 MF$0.65

13I. Machinery and Tools

STATIC SYSTEM FOR THE AUTOMATIC CONTROL OF ELECTRIC DRIVE.
Naval Intelligence Command Alexandria Va Translation Div
For primary bibliographic entry see Field 9C.
AD-713 386 HC$3.00 MF$0.65

LINEAR SUSPENSION SYSTEM PARAMETER IDENTIFICATION,
Army Tank Automotive Command Warren Mich
For primary bibliographic entry see Field 13E.
AD-713 546 HC$3.00 MF$0.65

THE USE OF MARTENSITE MATERIALS IN THE DESIGN OF THERMALLY ACTIVATED SPRINGS,
Frankford Arsenal Philadelphia Pa Pitman-Dunn Research Labs
For primary bibliographic entry see Field 11F.
AD-713 578 HC$3.00 MF$0.65

REMOTE AUTOMATIC TABULAR WELDING DEVICES FOR 18/8/1 STAINLESS STEEL. PROJECT DRAGON,
Atomic Energy Establishment, Winfrith (England).
A. R. Bateman, and E. Barnes. Feb 66, 40p

Descriptors: (*Welding machines, *Automatic welding), Austenitic stainless steels, Pipes (Tubes), Great Britain.
Identifiers: Dragon project.

For abstract, see NSA 24 20.
DP-Report-396 HC$3.00 MF$0.65

MOISTURE SEPARATOR DEVELOPMENT.
Quarterly progress rept. Apr-Jun 69.
MSA Research Corp., Evans City, Pa.

Aug 69, 4p

Descriptors: (*Moisture, *Separators), (*Air pollution control equipment, *Demisters), Nuclear reactor accidents, Dehumidifiers, Design.

For abstract, see NSA 24 20.
MSAR-69-151 HC$3.00 MF$0.65

MOISTURE SEPARATOR DEVELOPMENT.
Quarterly progress rept. Jul-Sep 69.
MSA Research Corp., Evans City, Pa.
Oct 69, 7p
See also Quarterly rept. Apr-Jun 69, MSAR-69-151.

Descriptors: (*Moisture, *Separators), (*Air pollution control equipment, *Demisters), Nuclear reactor accidents, Dehumidifiers, Reviews, Design.

For abstract, see NSA 24 20.
MSAR-69-192 HC$3.00 MF$0.65

MOISTURE SEPARATOR DEVELOPMENT.
Quarterly progress rept. Oct-Dec 69.
MSA Research Corp., Evans City, Pa.
Jan 70, 5p
See also Quarterly rept. Jul-Sep 69, MSAR-69-192.

Descriptors: (*Moisture, *Separators), (*Air pollution control equipment, *Demisters), Nuclear reactor accidents, Dehumidifiers, Design.

For abstract, see NSA 24 20.
MSAR-70-17 HC$3.00 MF$0.65

MOISTURE SEPARATOR DEVELOPMENT PROGRAM.
Quarterly progress rept. Jan-Mar 70.
MSA Research Corp., Evans City, Pa.
Apr 70, 4p
Contract AT (45-1)-2145
See also Quarterly rept. Oct-Dec 69, MSAR-70-17.

Descriptors: (*Moisture, *Separators), (*Air pollution control equipment, *Demisters), Nuclear reactor accidents, Dehumidifiers, Design.

For abstract, see NSA 24 20.
MSAR-70-79 HC$3.00 MF$0.65

EXPERIMENTAL LOAD CAPACITY AND POWER LOSS OF HERRINGBONE GROOVED GAS LUBRICATED JOURNAL BEARINGS.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
W. J. Anderson, R. E. Cunningham, and D. P. Fleming. May 70, 19p NASA-TM-X-52753
Conf- Presented At the Asme 1970 Spring Lubrication Symp., Detroit, 25-27 May 1970

Descriptors: *Gas bearings, *Journal bearings, *Load tests, *Power efficiency, *Rotor speed, Attitude (inclination), Grooves, Turbomachinery.

For abstract, see STAR 08 21.
N70-38550 HC$3.00 MF$0.65

13J. Marine Engineering

RUM II - REMOTE UNDERWATER MANIPULATOR.
Progress rept.,
Scripps Institution of Oceanography San Diego Calif Marine Physical Lab
Victor C. Anderson, Daniel K. Gibson, and Oskar H. Kirsten. 1970, 16p Rept no. MPL-U-73/69
Contract N00014-69-A-0200-6002
Availability: Pub. in Annual Preprints of the Marine Technology Society (6th), v1 29 Jun-1 Jul 70.

Descriptors: (*Underwater object locators, *Underwater vehicles), (*Man-machine systems, Configuration), Oceanographic equipment, Sensors, Remote control systems, Telemeter systems, Tracked vehicles, Actuators, Coaxial cables, Servomechanisms, Costs, Ocean bottom topography.
Identifiers: RUM (Remote Underwater Manipulators), *Remote underwater manipulators, *RUM-2 vehicles, Bottom crawlers, ORB (Oceanic Research Buoys), Oceanic research buoys, ORB vessels.

The 'RUM', an unmanned tethered bottom crawler is discussed. Unique features of the vehicle are, the ambient pressure exposed electronics and the time-frequency multiplex of all power, control and instrumentation telemetry, sonar and television onto a single coaxial umbilical cable. 'ORB' (Oceanographic Research Buoy), the 45-ft square, surface support vessel, in combination with 'RUM', forms a complete sea floor work system. 'ORB' is out-fitted for load handling with a center well, dynamic snubbing, cable handling and constant-tensioning system. These are discussed in brief. Operations in both shallow (100 ft) water depths and deep (3300 ft) water depths are described. Preliminary hourly operating cost estimates for the sea floor work system are significantly lower than manned submersible costs, primarily as a result of the extended mission times available with the unmanned system. (Author)
AD-713 080

INFLUENCE OF LENGTH-TO-DIAMETER RATIO ON BEHAVIOR OF CONCRETE CYLINDRICAL HULLS UNDER HYDROSTATIC LOADING.
Technical rept. Jul 68-Jun 69,
Naval Civil Engineering Lab Port Hueneme Calif
H. H. Haynes, and R. J. Ross. Sep 70, 55p Rept no. NCEL-TR-696

Descriptors: (*Hulls (Marine), Concrete), (*Concrete, Hydrostatic tests), Underwater equipment, Cylindrical bodies, Structural shells, Hydrostatic pressure, Manufacturing methods, Casting, Stresses, Structural properties, Test methods.
Identifiers: Concrete hulls, *Underwater structures, Implosions.

Fourteen hollow concrete cylindrical hulls ranging in length from 8 to 128 inches and having an outside diameter of 16 inches and a wall thickness of 2 inches were subjected to hydrostatic loading to determine the effect of cylinder length-to-outside-diameter ratio (L/D o) on the implosion pressure and strain behavior, and the distance from the edge of the cylinder in which radial displacement was influenced by the end closure. Hemispherical end closures were joined to the cylinders with epoxy, silicone rubber, or steel dowel pins and epoxy. The uniaxial compressive strength of the concrete averaged approximately 9,500 psi. (Author)
AD-713 088 HC$3.00 MF$0.65

ANALYSIS OF SLAMMING DATA FROM THE 'S.S. WOLVERINE STATE'.
Final rept.,
Teledyne Materials Research Co Waltham Mass
James W. Wheaton, Cyrus H. Kano, P. Thomas Diamant, and Fred C. Bailey. Aug 70, 76p Rept no. E-1166 (a) SSC-210
Contracts N00024-69-C-5198, NObs-94252
Sponsored in part by Contracts N00024-68-C-5231, N00024-67-C-5312.

Descriptors: (*Cargo ships, *Hydrodynamics), Impact, Stresses, Pressure, Acceleration, Velocity, Mathematical analysis.
Identifiers: *Slamming, Wolverine State vessel.

The stress recording system aboard the 'S.S. Wolverine State' was expanded to include pressure transducers and accelerometers. Stress, pressure, and accelerations signals were recorded on magnetic tape over a period of three years, and data on hundreds of slams were recorded. Slamming occurred only at Beaufort numbers above 5, and under relative headings within about 30 degrees of head seas. Reduction of speed did not appear to reduce the frequency of slamming, but the forward draft was a significant factor. Ochi's predictions of the statistical distribution of slamming occurrences were confirmed, as were his model data relating pressure and relative velocity at impact. The bow acceleration was found to be a sensitive indicator of slamming phenomena, and relationships between acceleration, velocity, and pressure were established. Slamming pressure levels were consistent with ship model test results, but were less than other full-scale and drop-test data reported in the literature. (Author)
AD-713 196 HC$3.00 MF$0.65

SEAMANSHIP MANUAL,
Naval Intelligence Command Alexandria Va Translation Div
A. O. Shabalin, N. P. Epikhin, N. I. Kabanov, E. B. Silnov, and M. S. Puskov. 14 Oct 70, 54p Rept no. NIC-Trans-3087 (a)
Trans. of mono. Spravochnik po Morskoi Praktike, Moscow, 1969 p247-301, 398-420.

Descriptors: (*Ships, *Paints), (*Sea rescue equipment, *Instruction manuals), Corrosion inhibition, USSR.
Identifiers: Translations.

Two chapters from the 'Seamanship Manual' are presented: Ship Painting; and Rescue Equipment.
AD-713 272 HC$3.00 MF$0.65

THE PROBLEM OF AN INFINITELY LONG CIRCULAR CYLINDER IN AN OBLIQUE SEA,
Admiralty Experiment Works Haslar (England)
For primary bibliographic entry see Field 20D.
AD-713 302 HC$3.00 MF$0.65

EXPERIMENTAL INVESTIGATION OF THE DRAG INDUCED BY BILGE VORTICES,
Iowa Inst of Hydraulic Research Iowa City
Jean-Claude Tatinclaux. 1970, 8p
Contract Nonr-1611 (05)
Availability: Pub. in Schiffstechnik, v87 n17 p37-44 1970.

Descriptors: (*Ship hulls, *Drag), (*Vortices, Drag), Ogives.
Identifiers: Bilges.

Wind-tunnel experiments were conducted, using a five-hole directional probe and a hot-wire anemometer, to investigate the vortices generated at the bilge of an ogive, representing an idealized double ship-model. The geometric characteristics of the vortices and the circulation were determined experimentally. These data were used to evaluate the vortical drag by applying an analytical expression derived for the case of n bilge vortices. The influence of the bilge curvature was investigated and it was found that the vortical drag decreases rapidly from 14 to 2 per cent of the surface drag when the ratio of the radius of curvature to the maximum width of the ogive is increased from 0 to 0.12. Subsequent experiments showed that the presence of bilge keels induces an increase in the vortical drag from 2 to 11 per cent of the surface drag when the ratio of the bilge height to the maximum width of the ogive increases from 0 to 0.08. (Author)
AD-713 343

LONGITUDINAL SIMULATION AND TRIALS OF THE Rx HYDROFOIL CRAFT,
Defence Research Establishment Atlantic Dartmouth (Nova Scotia)
R. T. Schmitke. 1970, 11p Rept no. DREA-69/2
Presented at the General Meeting (Annual), Halifax (Nova Scotia) 5 May 69.
Availability: Pub. in Canadian Aeronautics and Space Jnl., v16 n3 p109-115 Mar 70. No copies furnished.

Descriptors: (*Hydrofoil boats, Performance (Engineering)), Pitch (Motion), Hydrodynamics, Simulation, Canada.
Identifiers: Rx vessel.

A simulation is described of the longitudinal dynamics of the Rx, an experimental hydrofoil craft equipped with a quarter-scale version of the HMCS Bras d'Or (FHE-400) foil system. Simulated trim, rise and pitch response are in good agreement with trials results. (Author)
AD-713 387

PROTEUS-A VERSATILE VEHICLE FOR OPEN-WATER HYDRODYNAMICS RESEARCH,
Defence Research Establishment Atlantic Dartmouth (Nova Scotia)
N. E. Jeffrey, and W. E. Ellis. 14 Jan 70, 10p Rept no. DREA-69-5
Presented at the AIAA Advanced Marine Vehicles and Propulsion Meeting (2nd), Seattle, Wash. 21-23 May 69. Revision of report dated 13 May 69.
Availability: Pub. in Jnl. of Hydronautics, v4 n2 p60-65 Apr 70. No copies furnished.

Descriptors: (*Oceanographic vessels, Design), Marine propulsion, Hydrodynamics, Model tests, Canada.
Identifiers: PROTEUS vessel.

The design requirements and philosophy are described for a small, stable, high-powered craft for use as an experimental hydrodynamics research facility. The design concept evolved from requirements peculiar to the experience, environment, and resources of a small research laboratory and the result is a unique facility, tailored primarily for high-speed marine propulsion experiments, but with potential for much broader application. It is capable of operating at slow speeds as a displacement boat, at moderate speeds in a planing mode and at high speeds as a hydrofoil craft. Principal design characteristics, predicted performance, model tests, and instrumentation plans are reviewed. PROTEUS (Propulsion Research and Open-Water Testing of Experimental Underwater Systems) is currently under construction and is expected to be complete in 1971. (Author)
AD-713 403

CALCULATING AND REDUCING NOISE GENERATED BY MARINE GAS TURBINE PLANTS (Raschet i Snizhenie Shuma Sudovykh Gazoturbinnykh Ustanovok),
Naval Intelligence Command Alexandria Va Translation Div
For primary bibliographic entry see Field 20A.
AD-713 422 HC$3.00 MF$0.65

ENGINEERING AND COST ANALYSIS OF MARINE AIR CONDITIONING SYSTEMS (Tekhniko-Ekonomicheskii Analiz Sudovykh Sistem Konditsionirovaniya Vozdukha),
Naval Intelligence Command Alexandria Va Translation Div
V. M. Shamshin, E. I. Shifrin, and A. A. Mundinger. 23 Sep 70, 9p Rept no. NIC-Trans-3115
Trans. of Sudostroenie (USSR) v60 n1 p27-30 1970.

Descriptors: (*Cargo ships, Air conditioning equipment), (*Air conditioning equipment, Cost effectiveness), Marine engineering, Shipborne, Classification, Velocity, Temperature control, Cooling, Heating, Design, Efficiency, Analysis of variance, USSR.
Identifiers: Translations, Comparison.

The article presents the results of a comparative engineering and cost analysis of the principal types of marine air-conditioning systems in seagoing cargo ships: Computations for air-conditioning systems were made for a 15,000 dwt tanker with a full load displacement of 20,000 tons with a diesel propulsion plant rated at 9,000 hp. (Author)
AD-713 424 HC$3.00 MF$0.65

NUCLEAR SUBMARINES,
Naval Intelligence Command Alexandria Va Translation Div
G. I. Svyatov. 26 Aug 70, 21p Rept no. NIC-Trans-3101
Trans. of mono. Avtomnye Podvodnye Lodki, Moscow, 1969 p3-18, 164-172.

Descriptors: (*Ballistic missile submarines, USSR), Arctic regions, Ice islands, Polar regions, Marine nuclear propulsion, Submarine personnel.
Identifiers: Translations, *Nuclear powered ships.

The article gives a popularized description of Soviet submarine activities in a round the world cruise.
AD-713 425 HC$3.00 MF$0.65

MARINE ATOMIC STEAM-GENERATING INSTALLATIONS,
Naval Intelligence Command Alexandria Va Translation Div
For primary bibliographic entry see Field 21F.
AD-713 426 HC$3.00 MF$0.65

MANNED UNDERWATER STATION RESISTANCE IN STILL WATER AND IN WAVES.
Final rept. 28 Jun 68-15 Jul 69,
California Univ Berkeley Coll of Engineering
O. J. Sibul. Dec 69, 56p Rept no. NA-69-4 NCEL-CR-70.002
Contract N62399-68-C-0045

Descriptors: (*Underwater vehicles, *Drag), Ocean waves, Hydrodynamics, Manned, Model tests, Towed vehicles, Towing cables, Oscillation, Ocean currents.
Identifiers: *Manned underwater stations, MUS (Manned Underwater Stations).

Two models of Manned Underwater Stations were towed in still water as well as in waves. The resistances were measured and the optimum towing configurations recommended. The response curves for added resistance were derived from uniform wave tests. Then the added resistances were calculated for sea states 3 and 5 and compared with model tests. Dynamic forces in towing cable (caused by wave action) were measured. Some measurements were made to estimate overturning as well as oscillatory moments produced by bottom currents while the station is sitting on the bottom. (Author)
AD-713 458 HC$3.00 MF$0.65

MOORING SUMMARY 1969,
Woods Hole Oceanographic Institution Mass
Gordon H. Volkmann. Aug 70, 87p Rept no. WHOI-Ref-70-37
Contract N00014-66-C-0241
See also AD-689 356.

Descriptors: (*Oceanographic data, Measurement), (*Mooring, Networks), Ocean currents, Deep water, Acoustic properties, Cables (Mechanical), Nylon, Anchors (Marine), Transducers, Sonar beacons, Telemeter systems, Reviews.
Identifiers: Moored Arrays Project.

The report is the third in a series of mooring summaries which cover the moorings set by the Moored Arrays Project. This one covers all moorings set in 1969 and January of 1970. Included in this report is a brief review of events during 1969 from the point of view of the sea-going operations. There follows a reference list of the moorings with a short description. The main body consists of a verbal description of the mooring and the reasons for setting with a detailed drawing of the mooring and instrumentation. (Author)
AD-713 598 HC$3.00 MF$0.65

JOURNAL OF ABSTRACTS OF THE BRITISH SHIP RESEARCH ASSOCIATION. VOLUME 25, NUMBER 7, ABSTRACTS NO. 29, 589-29, 678,
British Ship Research Association Wallsend (England) Wallsend Research Station
R. C. Kahler. Jul 70, 38p
See Also Volume 25, number 6, AD-712 893.
Availability: Pub. in Jnl. of Abstracts, v25 n7 p489-526 Jul 70. No copies furnished.

Descriptors: (*Marine engineering, *Abstracts), Design, Hydrodynamics, Lubricants, Operation, Marine propulsion, Management engineering, Safety, Corrosion, Great Britain.

Contents: Ship design; Ship construction; Ship machinery and systems; Ship operation; Miscellaneous.
AD-713 681

SUBMARINES VERSUS SUBMARINES,
Naval Intelligence Command Alexandria Va Translation Div
N. I. Suzdalev. 22 Oct 70, 41p Rept no. NIC-Trans-3130
Trans. of mono. Podvodnie Lodki Protiv Podvodnikh Lodok, n.p., 1968 p45-87.

Descriptors: (*Submarines, Nuclear powered vessels), Marine nuclear propulsion, Ballistic missile submarines, Guided missiles (Underwater-to-surface), Antisubmarine ammunition, Rockets, Submarine hulls, State-of-the-art reviews, USSR.
Identifiers: Nato countries, Translations.

The report is a state-of-the-art review of present and proposed nuclear powered submarines of various non-communist countries.
AD-713 794 HC$3.00 MF$0.65

HYDRODYNAMIC RESPONSE OF AMMI CAUSEWAY IN SURF ZONE - VLAP.
Technical note Oct 68-Mar 69,
Naval Civil Engineering Lab., Port Hueneme, Calif.
Joseph A. Drelicharz. Jan 70, 99p NCEL-TN-1052
Distribution Limitation now Removed.

Descriptors: (*Naval operations, Vietnam), (*Logistics, Piers), (*Piers, Floating bodies), Barges, Hydrodynamics, Stability, Expanded plastics, Buoyancy, Water waves, Tides, Motion, Weight, Models (Simulations).
Identifiers: Da Nang (South Vietnam), *Floating piers, Shoaling waves.

The dynamic response of a light-weight, highly buoyant system can also produce critical problems in operations where relative motions between pontoon pier and ship, and pontoon barge and ship can be anticipated. Since a possibility of damage is inherent in such systems and because the tendency for future systems is toward lightweight materials and construction, pilot tests should be made to determine the dynamic response characteristics of pontoon systems. Such a study has been concluded, modeling the lightweight Ammi pontoons: its description and results are presented in this paper. The study is limited in scope and application and, therefore, further studies with other pontoon systems are necessary before the results can be used in developing an analytical response solution for general operating conditions. (Author)
AD-865 367 HC$3.00 MF$0.65

BIOLOGICAL SHIELDING OF MARITIME REACTORS,
National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.
For primary bibliographic entry see Field 18F.
AEC-tr-7097 HC$3.00 MF$0.65

SHIELDING IN NUCLEAR SHIPS,
Division of Technical Information Extension (AEC), Oak Ridge, Tenn.
For primary bibliographic entry see Field 18F.
For abstract, see NSA 24 20.
CONF-700211-2 HC$3.00 MF$0.65

COUNTERMEASURES AGAINST VIBRATION AND OSCILLATIONS OF SHIP REACTORS,
Division of Technical Information Extension (AEC), Oak Ridge, Tenn.
Yoshio Takada. 1970, 5p
Trans. of Japan Atomic Energy Society Meeting, Paper Tokyo, 12-13 Feb 70 n.d., n.p.

Descriptors: (*Nuclear powered ships, Reactor engineering), (*Ship hulls, Vibration damping), Oscillations, Model tests, Safety engineering, Translations, Japan.

For abstract, see NSA 24 20.
CONF-700211-5 HC$3.00 MF$0.65

N. S. SAVANNAH. FACILITY LICENSE NO. NS-1. TECHNICAL SPECIFICATIONS, CHANGE NO. 9.
Division of Reactor Licensing (AEC), Washington, D.C.
7 Aug 70, 2p

Descriptors: (*Nuclear powered ships, Nuclear reactor engineering), Nuclear reactor coolants, Cargo ships.
Identifiers: Savannah vessel.

For abstract, see NSA 24 20.
DOCKET-50238-64 HC$3.00 MF$0.65

N. S. SAVANNAH. FAILURE OF CONTROL ROD TO DRIVE IN.
First Atomic Ship Transport, Inc., New York.

4 Aug 70, 5p

Descriptors: (*Nuclear powered ships, Nuclear reactor control elements), Control rods, Failure, Cargo ships.
Identifiers: Savannah vessel.

For abstract, see NSA 24 20.
DOCKET-50238-65 HC$3.00 MF$0.65

TEXAS MARINE RESOURCES: THE PORTS AND WATERWAYS VIEW.
Texas Engineering Experiment Station, College Station. Industrial Economics Research Div.
For primary bibliographic entry see Field 5C.
PB-195 090 HC$3.00 MF$0.65

13K. Pumps, Filters, Pipes, Fittings, Tubing, and Valves

FIELD FABRICATION OF CONTINUOUS LIGHTWEIGHT REINFORCED PLASTIC PIPE. PHASE I. LITERATURE SEARCH.
Picatinny Arsenal Dover N J
For primary bibliographic entry see Field 11I.
AD-713 201 HC$3.00 MF$0.65

HERMETICALLY SEALED PUMPS IN NUCLEAR PROPULSION PLANTS,
Naval Intelligence Command Alexandria Va Translation Div
N. M. Sinev, and P. M. Udovichenko. 10 Aug 70, 156p Rept no. NIC-Trans-3097
Trans. of mono. Germeticheskie Vodyanye Nasosy Atomnoikh Energeticheskikh Ustanovok, Moscow, 1967 p7-41, 142-166, 204-298.

Descriptors: (*Light water reactors, Coolant pumps), Nuclear power plants, Boiling water reactors, Pressurized water reactors, Feed water, Hermetic seals, Rotary pumps, Structural parts, Performance (Engineering), USSR.
Identifiers: Translations.

The report describes coolant pumps used in nuclear power reactors. Performance of various configurations of pumps manufactured in the United States, Germany, and the USSR is analyzed.
AD-713 267 HC$3.00 MF$0.65

DIGITAL COMPUTER PROGRAM FOR APPROXIMATE STRESS-CONCENTRATION ANALYSIS FOR A NOZZLE IN A SPHERICAL PRESSURE VESSEL,
Newark Coll of Engineering N J Dept of Mechanical Engineering
For primary bibliographic entry see Field 20K.
AD-713 692 HC$3.00 MF$0.65

NAVAL FORCES AMPHIBIOUS ASSAULT BULK FUEL SYSTEM (AABFS)-LIGHTWEIGHT PIPE.
Technical note Nov 69-Jun 70,
Naval Civil Engineering Lab., Port Hueneme, Calif.
James J. Traffalis. May 70, 21p NCEL-TN-1101
Distribution Limitation now Removed.

Descriptors: (*Amphibious operations, Logistics), (*Fuel systems, *Pipes), Composite materials, Reinforced plastics, Glass textiles, Aluminum, Pipes, Compatibility, Supply depots, Cost effectiveness.
Identifiers: *Plastic pipe.

The requirement exists to improve the efficiency of logistic support systems employed during the amphibious assault and follow-on assault operations. New materials become available, which is properly used, could greatly improve the operational effectiveness of the system. This report documents the results of an investigation made to determine the potential improvements possible from the use of lightweight aluminum or fiberglass reinforced plastic pipe in the 600 GPM bottom laid AABFS. Findings of the investigation indicate that the operational and logistic problem resulting from the requirement for counterweighting or anchoring of the lightweight pipe will nullify any potential improvements to be gained from its use in the 600 GPM bottom laid AABFS. (Author)
AD-870 970 HC$3.00 MF$0.65

INVESTIGATION OF THE INITIATION AND EXTENT OF DUCTILE PIPE RUPTURE, PHASE II.
Battelle Memorial Inst., Columbus, Ohio.
For primary bibliographic entry see Field 18I.
For abstract, see NSA 24 20.
BMI-1887 HC$3.00 MF$0.65

PHASE REPORT NO. 115-1 ON STRESS INDICES FOR SMALL BRANCH CONNECTIONS WITH EXTERNAL LOADINGS,
Oak Ridge National Lab., Tenn.
E. C. Rodabaugh. Aug 70, 68p
Contract W-7405-eng-26

Descriptors: (*Pipe fittings, Stress analysis), (*Nuclear reactor engineering, Piping systems), Loads (Forces), Flexibility, Pressure vessels, Design standards.

For abstract, see NSA 24 20.
ORNL-TM-3014 HC$3.00 MF$0.65

DEFORMATION OF DRAINS BECAUSE OF SUBSIDENCE OF PEATS AFTER DRAINAGE,
National Tillage Machinery Lab., Auburn, Ala.
A. I. Murashko. 9 Mar 70, 27p
Trans. of mono. Plastic Drains, Minsk, 1969 p115-143, by William R. Gill.

Descriptors: (*Pipes, Deformation), (*Swamps, Drainage), Design, Construction, Land reclamation, Peat, Translations, Nomographs, USSR.

The design and construction of horizontal drains for bogs is associated with the sinkage of the bog after conduct of the reclamation. Equations describing the sinkage of drains are discussed and evaluated in comparison with actual sinkage of the drain. Nomograms have been prepared to describe the sinkage of the surface of the bog and the bottom of the drain in a low moor bog. Examples of calculations are provided. (Author)
PB-195 000T HC$3.00 MF$0.65

STABILITY AND DURABILITY OF PLASTIC DRAINS,
National Tillage Machinery Lab., Auburn, Ala.
A. I. Murashko. 17 Feb 70, 26p
Trans. of mono. Plastic Drains, Minsk, 1966 p145-170, by William R. Gill.

Descriptors: (*Plastic pipes, Durability), (*Swamps, Drainage), Stability, Peat, Mathematical prediction, Loads (Forces), Agricultural machinery, Translations, USSR.

Equations are developed to predict the sinkage of plastic drains in peat bogs. The equations show the importance of laying the pipes in narrow trenches to increase the stability of the drain to surface loading by agricultural machinery. Sample calculations are provided to demonstrate the application of the equations to actual field conditions. Calculations of pipe stability provide magnitudes of drain pipe stability under loading and therefore a means of predicting the resistance of pipes to destruction by agricultural machinery. (Author)
PB-195 001T HC$3.00 MF$0.65

COMPARISON OF USAS B31.7 PLASTIC FATIGUE ANALYSIS WITH TEST DATA ON PIPING COMPONENTS.
Battelle Memorial Inst., Columbus, Ohio.
For primary bibliographic entry see Field 18I.
For abstract, see NSA 24 20.
TID-25479 HC$3.00 MF$0.65

13L. Safety Engineering

A TECHNIQUE FOR THE ACQUISITION, STORAGE, AND RETRIEVAL OF SYSTEM SAFETY INFORMATION - WITH ATTACHED BIBLIOGRAPHY.
Martin Marietta Corp Denver Colo Denver Div
For primary bibliographic entry see Field 5B.
AD-713 135 HC$3.00 MF$0.65

BULLETIN OF THE RADIO AND ELECTRICAL ENGINEERING DIVISION OF THE NATIONAL RESEARCH COUNCIL OF CANADA. VOLUME 20, NUMBER 2, APRIL-JUNE 1970.
National Research Council of Canada Ottawa (Ontario) Radio and Electrical Engineering Div
For primary bibliographic entry see Field 9C.
AD-713 683

THE BEHAVIOR OF UO2 AEROSOLS IN CLOSED SYSTEMS,
Division of Technical Information Extension (AEC), Oak Ridge, Tenn.
For primary bibliographic entry see Field 18I.
For abstract, see NSA 24 20.
EURFNR-738 HC$3.00 MF$0.65

DESIGN OF A STATISTICAL INFORMATION SYSTEM FOR PRODUCT RELATED INJURIES.
Westat Research, Inc., Bethesda, Md.
For primary bibliographic entry see Field 5B.
PB-194 871 HC$3.00 MF$0.65

MULTIDISCIPLINARY ACCIDENT INVESTIGATION CASE NO. 70-7. CAR/FIXED OBJECT IMPACT.
Maryland Medical Legal Foundation, Inc., Baltimore.
Aug 70, 51p DOT-HS-600 211
Contract FH-11-7399

Descriptors: (*Motor vehicle accidents, *Accident investigations), Collision research, Rain, Skid resistance, Impact, Velocity, Automobile tires, Stability, Injuries, Blowouts.
Identifiers: *Automobile collisions, Fixed object collisions, Young male drivers, Reckless driving.

The accident occurred March 20, 1970 at 1:25 p. m. on I-695, 125 feet north of north/bound ramp from west/bound U. S. Route 40, Baltimore County, Maryland. One passenger vehicle was involved, which skidded and impacted steel over-head light pole. Vehicle was occuped by driver only, who suffered minor injury. (Author)
PB-194 875 HC$3.00 MF$0.65

MULTIDISCIPLINARY ACCIDENT INVESTIGATION CASE NO. 7023. TRUCK/MOTORCYCLE, FRONTEND/REAREND.
Miami Univ., Coral Gables, Fla.

Aug 70, 71p DOT-HS-600 223

Descriptors: (*Motor vehicle accidents, Accident investigations), Collision research, Motorcycles, Trucks, Velocity, Attention, Impact, Injuries.
Identifiers: *Young male drivers, Rear end collisions, Automobile motorcycle collisions, Speeding.

Approaching a T-section on a through street, February 28, at 12:10 P. M. in Dade County, Florida, Vehicle no. 1 was being chased by Vehicle no. 3 after a minor crash. It then rear-ended a motorcycle, lost control and flipped over, no fatalities. Collision causation: driver panicked after first minor altercation and high-speed driving by inexperienced driver. (Author)
PB-194 876 HC$3.00 MF$0.65

MULTIDISCIPLINARY ACCIDENT INVESTIGATION CASE NO. UNM 10. ONE-CAR ROLLOVER, FREEWAY.
New Mexico Univ., Albuquerque.

Aug 70, 60p DOT-HS-600 236

Descriptors: (*Motor vehicle accidents, *Accident investigations), Collision research, Freeways, Night vision, Velocity, Ethyl alcohol, Blood chemical analysis, Skid resistance, Stability, Injuries.
Identifiers: Young male drivers, Alcohol intoxication, Speeding, Rollover accidents.

The accident occurred on March 26, 1970, at 10:45 p.m. in the westbound lanes of an Interstate freeway. A 1968 Corvette coupe, traveling over 85 MPH, went out of control, skidded 390 feet, became airborne for 116 feet, went down a 25-foot embankment, crashed through a chain link fence, rolled over 3 times, and ended up on its wheels 644 feet from the point of loss of control. The driver was belted in and suffered only minor injuries. Fatique compounded by alcohol was a factor. (Author)
PB-194 877 HC$3.00 MF$0.65

MULTIDISCIPLINARY ACCIDENT INVESTIGATION CASE NO. UNM 14. RIGHT ANGLE INTERSECTION COLLISION.
New Mexico Univ., Albuquerque.

Aug 70, 80p DOTS-HS-600 240

Descriptors: (*Motor vehicle accidents, *Accident investigations), Collision research, Night vision, Attention, Intersections, Blood chemical analysis, Impact, Injuries.
Identifiers: *Automobile collisions, Intersection collisions.

The accident occurred at 10:06 p.m., February 20, 1970, in Albuquerque, New Mexico, at the intersection of a secondary arterial and a collector street. The NMAIP team arrived at 10:11 p.m. Vehicle no. 2 was struck in the left door area by vehicle no. 1. Vehicle no. 2 was crushed in 17 inches and the car spun through 270 degrees; it struck an 8-inch curb, and rolled one-half revolution coming to rest on its top. There was substantial top crush down and one passenger was critically injured. Inattention of driver no. 2 was the primary cause of the accident. (Author)
PB-194 878 HC$3.00 MF$0.65

IN-SERVICE EXPERIENCE ON INSTALLATION OF TEXAS MODULAR CRASH CUSHIONS.
Research rept.,
Texas Transportation Inst., College Station.
Monroe C. White, Don L. Ivey, and T. J. Hirsch.
Dec 69, 26p* RR-146-2
Prepared in cooperation with Bureau of Public Roads, Washington, D.C.

Descriptors: (*Safety devices, Motor vehicle accidents), (*Motor vehicle accidents, Insulation), (*Impact shock, Insulation), Highways, Performance, Expenses, Barrels (Containers).
Identifiers: *Modular crash cushions, *Crash cushions.

The Modular Crash Cushion, composed of 55-gallon steel barrels, was developed to decrease the severity of vehicle collisions with these gore obstacles. Three concrete abutment gore locations were the scene of eight fatal accidents reported during the period from September 1965 through October 1968. Modular Crash Cushions were installed at these three locations as well as at two other gore positions in late October 1968. Records show there have been thirteen accidents involving these installations through October 1969 with no serious injuries nor fatalities at any of these sites. As a result of this study, the following general conclusions were drawn: The modular crash cushions performed as designed; they effectively reduced the collision severity, as indicated by the thirteen reported crashes, to the extent that no fatalities or serious injuries occurred. At existing elevated exit ramps the greatest portion of the total initial cost, site modification, can be greatly reduced on new freeway construction by designing elevated gores to accept the modular crash cushion during initial construction. Maintenance costs are minimal and repair costs are resonable. Appearance is unobtrusive. This safety device was readily accepted by the public, police, news media, and highway engineers. (Author)
PB-194 884 HC$3.00 MF$0.65

MULTIDISCIPLINARY ACCIDENT INVESTIGATION CASE NO. UNM 12. HIGH SPEED ROLLOVER.
New Mexico Univ., Albuquerque.

Aug 70, 95p DOT-HS-600 238

Descriptors: (*Motor vehicle accidents, *Accident investigations), Collision research, Blood chemical analysis, Ethyl alcohol, Velocity, Night vision, Stability, Impact, Slopes, Ejection, Death.
Identifiers: Young male drivers, Rollover accidents, Speeding.

A 1970 Mercury Cougar carrying 7 people, going over 90 MPH went out of control, scraped a bridge curb, struck an unprotected light standard, became airborne, and rolled down a steep slope. The right door handle was torn off allowing the door to open; the driver and a passenger were ejected through the open door and killed. The other passengers received only minor injuries. Alcohol and excessive speed caused the accident; poor highway design compounded it. (Author)
PB-194 886 HC$3.00 MF$0.65

MULTIDISCIPLINARY ACCIDENT INVESTIGATION CASE NO. UNM 17. TWO CAR INTERSECTION COLLISION.
New Mexico Univ., Albuquerque.

Aug 70, 62p DOT-HS-600 243

Descriptors: (*Motor vehicle accidents, *Accident investigations), Collision research, Night vision, Attention, Blood chemical analysis, Velocity, Roads, Curvature, Stability, Injuries.
Identifiers: *Automobile collisions, Intersection collisions, Freeway exits, Road curves, Speeding, Alcohol intoxication, Young male drivers.

The accident occurred at the junction of a freeway exit ramp and an urban arterial on May 27, 1970, at 12:15 a.m. The driver of vehicle no. 1, traveling at a high rate of speed, failed to negotiate a sharp curve in the exit, crossed the arterial and collided with another car. Alcohol, inattention, and excessive speed were factors in the accident. (Author)
PB-194 887 HC$3.00 MF$0.65

DEVELOPING TRAFFIC FLOW INDICES FOR THE DETECTION OF HIGH ACCIDENT POTENTIAL HIGHWAYS IN NORTH CAROLINA.
Final rept. (Part 2),
North Carolina State Univ., Raleigh. Highway Research Program.
C. L. Heimbach, P. W. Allred, Jr., R. L. Anderson, J. R. Atkins, and J. W. Hooper, III. Oct 68, 76p
Prepared in cooperation with Bureau of Public Roads, Washington, D.C.

Descriptors: (*Vehicular traffic, Statistical data), (*Motor vehicle accidents, Forecasting), (*Highways, Hazards), Velocity, Statistical analysis, Trafficability, Traffic surveys.

The objective of the investigation was to further investigate the relationship between the mean number of speed changes per minute and motor vehicle accident rates for twenty-six sections of two-lane rural primary highway having uniform geometric design and roadside development characteristics, but varying traffic volumes and accident rates. Also investigated was the relationship between the speed change parameter and the traffic volume and volume to capacity ratio on each section. (Author)
PB-194 898 HC$3.00 MF$0.65

MULTIDISCIPLINARY ACCIDENT INVESTIGATION CASE NO. 6970-26. CAR/VAN - INTERSECTION.
Miami Univ., Coral Gables, Fla.
Aug 70, 93p DOT-HS-600 225

Descriptors: (*Motorvehicle accidents, *Accident investigations), Collision research, Trucks, Velocity, Intersections, Impact, Death.
Identifiers: *Automobile collisions, Intersection collisions, Young male drivers, Speeding.

The intersection crash occurred when the driver of a 1969 International Box Van (Vehicle no.1), westbound from a stop sign, failed to yield the right of way to a southbound 1969 Mustang (Vehicle no. 2). Vehicle no. 1, struck on the right side just forward of the rear wheel, was rotated clockwise approximately 90 degrees and turned over on its left side. Vehicle no. 2 also rotated 90 degrees clockwise before coming to rest. The driver of vehicle no. 1 was partially ejected; his head was crushed; and he was dead on the scene. The driver of Vehicle no. 2 left the scene, but voluntarily went to the police station about three weeks later. (Author)
PB-194 901 HC$3.00 MF$0.65

MULTIDISCIPLINARY ACCIDENT INVESTIGATION CASE NO. UNM 05. CAR UNDERRUNNING TRUCK.
New Mexico Univ., Albuquerque.

Aug 70, 57p DOT-HS-600 235

Descriptors: (*Motor vehicle accidents, *Accident investigations), Collision research, Blood chemical analysis, Ethyl alcohol, Trucks, Trailers, Impact, Injuries.
Identifiers: *Automobile collisions, Rear end collisions, Trailer car collisions, Speeding.

The accident occurred on December 29, 1969, at 6:31 p.m. in the eastbound lanes of an interstate freeway. A 1969 Plymouth Fury II ran into the left rear of a trailer being pulled by a truck tractor. The driver of the car was severely injured. Alcohol was involved in the accident. (Author)
PB-194 902 HC$3.00 MF$0.65

USE OF A RUMBLE STRIPE TO REDUCE MAINTENANCE AND INCREASE DRIVING SAFETY.
Utah State Dept. of Highways. Materials and Tests Div.
For primary bibliographic entry see Field 13B.
PB-194 933 HC$3.00 MF$0.65

EXECUTIVE SUMMARY. AUTOMOBILE DEFECT RECALL CAMPAIGNS.
Intext Transportation Research Div., Scranton, Pa.

For primary bibliographic entry see Field 13F.
PB-194 934 HC$3.00 MF$0.65

AUTOMOBILE DEFECT RECALL CAMPAIGNS. A SURVEY OF TIME PHASED EFFECTIVENESS AND OWNER SATISFACTION.
Intext Transportation Research Div., Scranton, Pa.
For primary bibliographic entry see Field 13F.
PB-194 935 HC$3.00 MF$0.65

METHANE EMISSION RATE STUDIES IN A NORTHERN WEST VIRGINIA MINE.
Bureau of Mines, Washington, D.C.
For primary bibliographic entry see Field 8I.
PB-194 949 HC$3.00 MF$0.65

VEHICLE SPEED AND RURAL AUTOMOTIVE CRASH INJURY. PART I: ESTIMATED TRAVELING SPEED AND FATALITIES.
Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
Robert A. Wolf, John W. Garrett, Jaakko K. Kihlberg, Raymond R. McHenry, and Richard P. Mayor. Jan 69, 45p CAL-VJ-2721-R1 DOT-HS-800 285
Contract FH-11-7098
Report on Automotive crash injury research. See also Part 2, PB-194-971.

Descriptors: (*Motor vehicle accidents, *Injuries), Collision research, Velocity, Death, Statistical data, Rural areas.
Identifiers: Automotive crash injury research, *Automobile collisions.

As Part I of a forthcoming Automotive Crash Injury Research (ACIR) series of studies on the relations among vehicle speed, accident type, injury, and death in automobile accidents, tabulations of fatality rates at various estimated traveling speeds are presented. Fourteen typical accident configurations (types) are defined, and detailed tabulations are presented for seven leading (most common) configurations. Data are given separately for drivers without passengers, drivers with passengers, front passengers, and rear passengers. Likewise, data are given separately for nonejected occupants and ejected occupants. The tabulations provided information on the relation of fatality rate to traveling speed, accident type, seated position, and ejection. (Author)
PB-194 970 HC$3.00 MF$0.65

VEHICLE SPEED AND RURAL AUTOMOTIVE CRASH INJURY. PART II: ESTIMATED TRAVELING SPEED AND INJURIES IN SINGLE VEHICLE FRONTAL CRASHES.
Technical rept.,
Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
Roger Fargo, John W. Garrett, and Jaakko K. Kihlberg. Oct 69, 54p* CAL-VJ-2721-R7 DOT-HS-800 286
Contract FH-11-7098
Report on Automotive crash injury research. Prepared in cooperation with Automobile Manufacturers Association, Inc. See also Part 1, PB-194 970.

Descriptors: (*Motor vehicle accidents, *Injuries), Collision research, Velocity, Death, Rural areas, Statistical data, Safety belts, Ejection, Children, Adults.
Identifiers: Automotive crash injury research, *Automobile collisions, Head on collisions.

The speed-injury relationships for single vehicle frontal crashes are examined. Data were obtained from state police and physicians in 31 states participating in the ACIR interstate program. Study data consist of 5,824 cars and 10,859 occupants involved in injury-producing single vehicle frontal impacts. The objective of the study is to clarify some of the relationships between traveling speed and injury.
PB-194 971 HC$3.00 MF$0.65

AUTOMOBILE SIDE IMPACTS AND RELATED INJURIES.
Technical rept.,
Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
Mordecai Friedberg, John W. Garrett, and Jaakko K. Kihlberg. Dec 69, 88p CAL-VJ-2721-R8 HS-800 287
Contract FH-11-7098
Report of Automative crash injury research. Prepared in cooperation with Automobile Manufacturers Association, Inc.

Descriptors: (*Motor vehicle accidents, *Injuries), Collision research, Impact, Penetration, Rural areas, Statistical data.
Identifiers: Automotive crash injury research, *Automobile collisions, Automobile side impacts.

The study is based on data from 1,490 cars that impacted in the side compartment area with another vehicle or an object. Accident data were obtained from rural areas of 31 states participating the the ACIR program and include only injury accidents. Estimates of the area and depth of penetration into the compartment were made, using photographs taken by investigating state police officers. For study purposes, both vehicle damage and occupant injury were examined in terms of body style and chassis frame type. (Author)
PB-194 972 HC$3.00 MF$0.65

TRUCKS IN RURAL INJURY PRODUCING AND PROPERTY DAMAGE UTAH ACCIDENTS.
Technical rept.,
Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
William E. Schotz, and Shirley J. Robinson. Dec 69, 112p* CAL-VJ-2721-R9 HS-800 288
Contract FH-11-7098
Report on Automotive crash injury research. See also Report dated Jul 69, PB-191 172. Prepared in cooperation with Automobile Manufacturers Association, Inc.

Descriptors: (*Motor vehicle accidents, *Trucks), (*Utah, *Accident investigations), Injuries, Damage assessment, Statistical data, Rural areas, Collision research.
Identifiers: *Automotive crash injury research, *Tractor trailers, *Truck auto underrides, *Tractor trailer cab tilting, *Property damage (Vehicles), *Bodily injury (Motor vehicle accidents).

Information pertaining to 2,366 multipurpose passenger vehicles , trucks and buses involved in 2,130 rural injury producing and property damage accidents is presented in this report. During the study period (September 1965 to September 1967), the Utah Highway Patrol reported a total of 7,650 accidents to ACIR. In addition to distinguishing between school buses (21) and other buses (30), the five major groups -- MPV (158), pickup (1,289), van delivery (69), straight trucks (442), and tractor-trailer combination (357) -- were refined so that in total, eighteen vehicle types were examined. (Author)
PB-194 973 HC$3.00 MF$0.65

POST-CRASH COMMUNICATIONS.
Final rept.,
AIL, Deer Park, N.Y.
Harold Lunefeld, Robert G. Varady, and Gerald N. Newburg. Jul 70, 183p* AIL-9362-1 DOT-HS (19)-800 289, FH-11-7335-1
Contract FH-11-7335

Descriptors: (*Motor vehicle accidents, *Telecommunication), Occurrence, Detection, Traffic control, Environment, First aid, Ambulances, Hospitalizing, Feasibility, Benefit cost analysis.
Identifiers: *Motor vehicle post crash communication systems, Emergency operations, Crash warning, Post crash operations.

The study was performed to determine the requirements and design concepts for a Motor Vehicle Post Crash Communications System (MVPCCS). The post-crash problem was studied in terms of the physical environment, post-crash incidents and emergencies, and community emergency response resources. Benefits that could be derived by a communications system that would reduce present detection and notification time lags were evaluated. Requirements for a system that would automatically detect and locate post crash incidents were developed, and the state-of-the-art of technology to achieve these requirements were surveyed. Preliminary system configurations were designed, and a cost benefit analysis conducted. (Author)
PB-194 974 HC$3.00 MF$0.65

DEALER WARRANTY: GARAGE REPAIR FOR TRUCKS AND BUSES.
Operations Research, Inc., Silver Spring, Md.
For primary bibliographic entry see Field 13F.
PB-194 975 HC$3.00 MF$0.65

MULTIDISCIPLINARY ACCIDENT INVESTIGATION CASE NO. 70-4. CAR/FIXED OBJECT IMPACT.
Maryland Medical Legal Foundation, Inc., Baltimore.

Aug 70, 54p DOT-HS-600 209
Contract FH-11-7399

Descriptors: (*Motor vehicle accidents, *Accident investigations), Collision research, Blood chemical analysis, Ethyl alcohol, Attention, Impact, Injuries.
Identifiers: *Automobile collisions, Fixed object collisions.

The document records a multidisciplinary accident investigation of a collision occurring on an ordinary two-lane highway in a residential area, involving a medium-sized American manufactured passenger vehicle. The vehicle drifted off the edge of the highway, impacting, with the right front, a wooden utility pole. The vehicle sustained moderate damage, and the driver (sole occupant) received minor injuries. (Author)
PB-195 015 HC$3.00 MF$0.65

SPEED AND ACCIDENTS. VOLUME I.
Final rept.
Research Triangle Inst., Durham, N.C.

26 Jun 70, 45p* RTI-SU-409-F-1 DOT-HS-800 297
Contract FH-11-6965
See also Volume 2, PB-195 017.

Descriptors: (*Motor vehicle accidents, Velocity), (*Accident investigations, Motor vehicle accidents), Collision research, Vehicular traffic, Statistical data, Detectors.

The major findings of this investigation of involvement rate as a function of speed deviation of the accident-involved vehicle from the mean traffic speed are given in this volume. The primary result is that the likelihood of involvement as a function of speed deviation is a U-shaped relationship. The likelihood of involvement is estimated to be greater by a factor of about 6 to 21, depending on the type of road, for large speed deviations as opposed to small speed deviations and ignoring the accidents involving turning maneuvers. The latter include about 44% of all of the observed accidents. This volume contains a brief statement of the objectives, plan of research, a summary of the results, recommendations and conclusions. In addition the pertinent single page tables and figures from Volume II are included and an example page is given of the long tables. (Author)
PB-195 016 HC$3.00 MF$0.65

SPEED AND ACCIDENTS. VOLUME II.
Final rept.
Research Triangle Inst., Durham, N.C.
26 Jun 70, 221p* RTI-SU-409-F-2 DOT-HS-800 298

Contract FH-11-6965
See also Volume 1, PB-195 016.

Descriptors: (*Motor vehicle accidents, Velocity), (*Accident investigations, Motor vehicle accidents), Collision research, Vehicular traffic, Statistical data, Detectors.

In the last few years it has become the conviction of some investigators that, instead of blaming the absolute values of speeds for accidents, it may be more prudent to examine the extent to which accident-involved vehicles have deviated from the average speeds of surrounding traffic flow. The relationship between accident-involvement rate and the speed deviation of the accident-involved vehicle from the average of the surrounding traffic flow was investigated during this study. Accident and speed data were collected in Monroe County, Indiana by the Institute for Research in Public Safety of Indiana University. Based on these data it is concluded that a U-shaped relationship between involvement rate and speed deviation exists. The volume contains a detailed description of the data collection procedures, the methods used in analysis, and a tabulation of the results. (Author)
PB-195 017 HC$3.00 MF$0.65

MULTIDISCIPLINARY ACCIDENT INVESTIGATION CASE NO. 031. CAR, ROLLOVER.
Miami Univ., Coral Gables, Fla.
Aug 70, 62p DOT-HS-600 228
Prepared in cooperation with the Dade County, Florida, Citizens Safety Council.

Descriptors: (*Motor vehicle accidents, *Accident investigations), Attention, Velocity, Stability, Injuries, Brakes (Motion arresters).
Identifiers: Rollover accidents, Freeway exits, Freeway exit ramps.

The accident occurred on an exit ramp from an expressway, Dade County, Florida, in March, 1970, at midday. The vehicle attempting to exit expressway struck roadside object and was rolled over one complete turn. (Author)
PB-195 025 HC$3.00 MF$0.65

MULTIDISCIPLINARY ACCIDENT INVESTIGATION CASE NO. 1181D. CAR/TRUCK, HEADON COLLISION,
California Univ., Los Angeles. UCLA Collision Investigation Program.

Aug 70, 63p DOT-HS-600 261
Contract FH-11-6690

Descriptors: (*Motor vehicle accidents, *Accident investigations), Collision research, Attention, Trucks, Impact, Death, Injuries.
Identifiers: *Automobile collisions, Truck collisions, Head on collisions.

The accident occurred at 5:30 p.m. on a 4-lane, undivided suburban road in California. A car was southbound at 45-50 mph, and was seen to be weaving from lane to lane. As it approached a truck which was northbound in the no. 2 lane at 40-45 mph, the car swerved across the double yellow line into the northbound no. 1 lane. The car and the truck collided in a 10 o'clock left front configuration. The car rotated 90 deg. counterclockwise, coming to rest. The occupants moved forward and to the left. The right front passenger, who had moved to the left, struck the windshield header and hood, which had been forced upwards and rearwards by the truck contact. The truck continued to move northbound for 96 ft., until it turned to the left off the road, colliding with a building 70 ft. from the west edge of the roadway. (Author)
PB-195 026 HC$3.00 MF$0.65

MULTIDISCIPLINARY ACCIDENT INVESTIGATION CASE NO. 6970-20. CAR/MOTORCYCLE, INTERSECTION COLLISION.
Miami Univ., Coral Gables, Fla.

Aug 70, 65p DOT-HS-600 221

Descriptors: (*Motor vehicle accidents, *Accident investigations), Collision research, Blood chemical analysis, Ethyl alcohol, Attention, Intersections, Night vision, Injuries, Brain damage.
Identifiers: *Automobile collisions, Motorcycle collisions, Young male drivers, Intersection collisions.

The accident occurred at 1:20 A.M., February 5, 1970, in Dade County, Florida, at a suburban intersection of two roadways. A car, westbound, approached the intersection in the left turn lane, waited for an eastbound vehicle to clear the intersection and, with a green signal cut sharply to the south into the path of a motorcycle. The driver of the motorcycle propelled over the hood of the car (fractured right corner of windshield), landed on helmeted head about 20 feet from point of impact. He suffered extensive post-crash mental degeneration. (Author)
PB-195 027 HC$3.00 MF$0.65

BIBLIOGRAPHIES ON FABRIC FLAMMABILITY. PART 5. TESTING AND TEST METHODS.
Technical note,
National Bureau of Standards, Washington, D.C. Inst. for Applied Technology.
Sidney H. Greenfeld, Elizabeth R. Warner, and Hilda W. Reinhart. Sep 70, 41p* NBS-TN-498-2
See also Part 4, PB-193 246. Paper copy also available from Superintendent of Documents, GPO, Washington, D.C. 20402. $0.45 as C13.46:498-2.

Descriptors: (*Fabrics, *Flammability), (*Flammability testing, *Bibliographies), Tests, Burning rate, Combustion, Flame propagation, Gases, Ignition, Smoke, Materials, Fire resistance.

The document relates to test methods and testing of fabrics and products made from fabrics and related materials. It cuts across product lines and covers all of the products within the ranges defined in the 1967 amendment to the Flammable Fabrics Act. Approximately 300 citations are included. (Author)
PB-195 028 HC$0.45 MF$0.65

MULTIDISCIPLINARY ACCIDENT INVESTIGATION CASE NO. 28. FIXED OBJECT IMPACT,
Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
22 Apr 70, 50p DOT-HS-600 169
Contract FH-11-7098

Descriptors: (*Motor vehicle accidents, *Accident investigations), Collision research, Judgment, Attention, Impact, Injuries.
Identifiers: *Automobile collisions, Fixed object collisions.

The accident occurred on Chestnut Ridge Road, 1100' west of Sweet Home Road, Amherst, New York on March 10, 1970 at 8:05 AM. The accident involved one car which went off the road and struck a utility pole. (Author)
PB-195 029 HC$3.00 MF$0.65

IMPACT CAPABILITY OF SAFETY GLAZING MATERIALS.
Southwest Research Inst., San Antonio, Tex.
For primary bibliographic entry see Field 13F.
PB-195 040 HC$3.00 MF$0.65

CITY OF NEW YORK EMERGENCY AMBULANCE SERVICE DEMONSTRATION PROJECT,
New York City Office of the Mayor. Office of Adminstration.
For primary bibliographic entry see Field 6G.
PB-195 053 HC$3.00 MF$0.65

DISPERSAL OF EMERGENCY AMBULANCES IN THE CITY OF NEW YORK: A DEMONSTRATION AND ANALYSIS,
New York City Office of the Mayor. Office of Administration.
For primary bibliographic entry see Field 6G.
PB-195 054 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT). THE BUS AND TRUCK SUPPLY COMPANY.
Electrical Testing Labs., Inc., New York.
For primary bibliographic entry see Field 13F.
PB-195 056 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 103 (WINDSHIELD DEFROSTING AND DEFOGGING SYSTEMS). CHRYSLER CORPORATION 1970 DODGE CORONET.
General Testing Labs., Inc., Springfield, Va.
For primary bibliographic entry see Field 13F.
PB-195 057 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). INLAND MANUFACTURING DIVISION (GENERAL MOTORS CORPORATION).
Electrical Testing Labs., Inc., New York.
For primary bibliographic entry see Field 13F.
PB-195 058 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). INLAND MANUFACTURING DIVISION (GENERAL MOTORS CORPORATION).
Electrical Testing Labs., New York.
For primary bibliographic entry see Field 13F.
PB-195 059 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). INLAND MANUFACTURING DIVISION (GENERAL MOTORS CORPORATION).
Electrical Testing Labs., Inc., New York.
For primary bibliographic entry see Field 13F.
PB-195 060 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). ALFRED TEVES (GERMANY).
Electrical Testing Labs., Inc., New York.
For primary bibliographic entry see Field 13F.
PB-195 061 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). CASTROL OILS, INC.
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 062 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). KELLY-SPRINGFIELD TIRE COMPANY.
Ogden Technology Labs., Inc., Monterey Park, Calif.
For primary bibliographic entry see Field 13F.
PB-195 063 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). INLAND MANUFACTURING DIVISION (GENERAL MOTORS CORPORATION).
Ogden Technology Labs., Inc., Monterey Park, Calif.
For primary bibliographic entry see Field 13F.
PB-195 064 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). INLAND MANUFACTURING DIVISION (GENERAL MOTORS CORPORATION).
Ogden Technology Labs., Inc., Monterey Park, Calif.
For primary bibliographic entry see Field 13F.
PB-195 065 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). INLAND MANUFACTURING DIVISION (GENERAL MOTORS CORPORATION).
Ogden Technology Labs., Inc., Monterey Park, Calif.
For primary bibliographic entry see Field 13F.
PB-195 066 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). INLAND MANUFACTURING DIVISION (GENERAL MOTORS CORPORATION).
Ogden Technology Labs., Inc., Monterey Park, Calif.
For primary bibliographic entry see Field 13F.
PB-195 067 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). INLAND MANUFACTURING DIVISION (GENERAL MOTORS CORPORATION).
Ogden Technology Labs., Inc., Monterey Park, Calif.
For primary bibliographic entry see Field 13F.
PB-195 068 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). FIAT S.P.A.
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 069 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). WARWICK LABORATORIES, INC.
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 070 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). V - O MANUFACTURING COMPANY.
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 071 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT). TOYOTA MOTOR COMPANY, LTD.
Electrical Testing Labs., Inc., New York.
For primary bibliographic entry see Field 13F.
PB-195 072 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT). TOYOTA MOTOR COMPANY, LTD.
Electrical Testing Labs., Inc., New York.
For primary bibliographic entry see Field 13F.
PB-195 073 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT). GENERAL MOTORS CORPORATION.
Electrical Testing Labs., Inc., New York.
For primary bibliographic entry see Field 13F.
PB-195 074 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). THE DAYTON TIRE AND RUBBER COMPANY.
Compliance Testing, Inc., Ravenna, Ohio.
For primary bibliographic entry see Field 13F.
PB-195 075 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). THE GOODYEAR TIRE AND RUBBER COMPANY.
Ogden Technology Labs., Inc., Deer Park, N.Y. Test Lab.
For primary bibliographic entry see Field 13F.
PB-195 076 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 103 (WINDSHIELD DEFROSTING AND DEFOGGING SYSTEMS). FORD MOTOR COMPANY 1970 GALAXIE FORD.
General Testing Labs., Inc., Springfield, Va.
For primary bibliographic entry see Field 13F.
PB-195 080 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). INLAND MANUFACTURING DIVISION (GENERAL MOTORS CORPORATION).
Electrical Testing Labs., Inc., N.Y.
For primary bibliographic entry see Field 13F.
PB-195 081 HC$3.00 MF$0.65

MULTIDISCIPLINARY ACCIDENT INVESTIGATION CASE NO. MCR-70-7. CAR/CAR BROADSIDE (INTERSECTION),
Indiana Univ., Bloomington.

Aug 70, 85p DOT-HS-600 205
Contract FH-11-7244

Descriptors: (*Motor vehicle accidents, *Accident investigations), Collision research, Attention, Judgement, Roads, Sands, Gravel, Intersections, Impact, Injuries.
Identifiers: *Automobile collisions, Intersection collisions.

The collision occurred at the intersection of Indiana 46 Bypass and Fee Lane on the northeast edge of Bloomington, Indiana, 13 March 1970, 1530 hours, Friday, involving 2 cars in a broadside collision. (Author)
PB-195 092 HC$3.00 MF$0.65

MULTIDISCIPLINARY ACCIDENT INVESTIGATION CASE NO. 7013. GUARDRAIL IMPACT - ROLLOVER.
Southwest Research Inst., San Antonio, Tex.

Aug 70, 67p DOT-HS-600 249
Contract FH-11-7219

Descriptors: (*Motor vehicle accidents, *Accident investigations), Collision research, Attention, Behavior, Impact, Injuries.
Identifiers: *Automobile collisions, Rollover accidents, Young male drivers, Lane changing.

The report is a multidisciplinary investigation of an automobile accident in which a car was forced off of the traveled roadway into an adjacent guardrail and subsequently rolled over onto its roof. The car that caused the accident fled the scene, but was subsequently apprehended. (Author)
PB-195 093 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 105 (BRAKES). FORD MOTOR COMPANY 1970 FORD THUNDERBIRD.
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
For primary bibliographic entry see Field 13F.
PB-195 094 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 105 (BRAKES). GENERAL MOTORS CORPORATION 1970 CHEVROLET IMPALA.
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
For primary bibliographic entry see Field 13F.
PB-195 095 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 105 (BRAKES). GENERAL MOTORS CORPORATION 1970 BUICK ELECTRA 225.
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 096 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). LOCKHEED (ENGLAND).
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 097 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). RIVERSIDE (MONTGOMERY WARD).
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 098 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). NIEHOFF AND COMPANY.
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 099 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). SEARS ROEBUCK AND COMPANY.
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 100 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). TECHNICAL CHEMICAL COMPANY.
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 101 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). UNITED CO-OPERATIVES.
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 102 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). INTERNATIONAL METAL POLISH.
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 103 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). WAGNER ELECTRIC CORPORATION.
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 104 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). UNIROYAL MERCHANDISING, INC.
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 105 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). CASTROL OILS, INC.
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 106 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 202 (HEAD RESTRAINTS). FORD MOTOR COMPANY 1970 GALAXIE FORD.
General Testing Labs., Inc., Springfield, Va.
For primary bibliographic entry see Field 13F.
PB-195 107 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 105 (BRAKES). GENERAL MOTORS CORPORATION 1970 CHEVROLET MONTE CARLO.
Dynamic Science, Phoenix, Ariz. AvSER Facility.
For primary bibliographic entry see Field 13F.
PB-195 108 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). THE WEATHERHEAD COMPANY.
Ogden Technology Labs., Inc., Monterey Park, Calif.
For primary bibliographic entry see Field 13F.
PB-195 109 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). INLAND MANUFACTURING DIVISION (GENERAL MOTORS CORPORATION).
Ogden Technology Labs., Monterey Park, Calif.
For primary bibliographic entry see Field 13F.
PB-195 110 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). INLAND MANUFACTURING DIVISION (GENERAL MOTORS CORPORATION).
Ogden Technology Labs., Inc., Monterey Park, Calif.
For primary bibliographic entry see Field 13F.
PB-195 111 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). INLAND MANUFACTURING DIVISION (GENERAL MOTORS CORPORATION).
Ogden Technology Labs., Inc., Monterey Park, Calif.
For primary bibliographic entry see Field 13F.
PB-195 112 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). INLAND MANUFACTURING DIVISION (GENERAL MOTORS CORPORATION).
Ogden Technology Labs., Inc., Monterey Park, Calif.
For primary bibliographic entry see Field 13F.
PB-195 113 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). WAGNER ELECTRIC CORPORATION.
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 114 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). BOWES SEAL FAST CORP.
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 115 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116 (HYDRAULIC BRAKE FLUIDS). FAR BEST CORPORATION.
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 116 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT). GENERAL MOTORS CORPORATION.
Electrical Testing Labs., Inc., New York.
For primary bibliographic entry see Field 13F.
PB-195 117 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT). GENERAL MOTORS CORPORATION.
Electrical Testing Labs., Inc., New York.
For primary bibliographic entry see Field 13F.
PB-195 118 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT). GENERAL MOTORS CORPORATION.
Electrical Testing Labs., Inc., New York.
For primary bibliographic entry see Field 13F.
PB-195 119 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT). GENERAL MOTORS CORPORATION.
Electrical Testing Labs., Inc., New York.
For primary bibliographic entry see Field 13F.
PB-195 120 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT) GENERAL MOTORS CORPORATION.
Electrical Testing Labs., New York.
For primary bibliographic entry see Field 13F.
PB-195 121 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT) GENERAL MOTORS CORPORATION.
Electrical Testing Labs., Inc., New York.
For primary bibliographic entry see Field 13F.
PB-195 122 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT) GENERAL MOTORS CORPORATION.
Electrical Testing Labs., Inc., New York.
For primary bibliographic entry see Field 13F.
PB-195 123 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT). GENERAL MOTORS CORPORATION.
Electrical Testing Labs., Inc., New York.
For primary bibliographic entry see Field 13F.
PB-195 124 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108 (LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT). GENERAL MOTORS CORPORATION.
Electrical Testing Labs., Inc., New York.
For primary bibliographic entry see Field 13F.
PB-195 125 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). CONTINENTAL GUMMI WERKE A.G. (GERMANY).
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
For primary bibliographic entry see Field 13F.
PB-195 126 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). THE MOHAWK RUBBER COMPANY.
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
For primary bibliographic entry see Field 13F.
PB-195 127 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). THE GOODYEAR TIRE AND RUBBER COMPANY.
Automotive Research Associates, Inc., San Antonio, Tex.
For primary bibliographic entry see Field 13F.
PB-195 128 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). THE MOHAWK RUBBER COMPANY.
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
For primary bibliographic entry see Field 13F.
PB-195 129 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). N. V. NEDERLANDSCH - AMERIKAANSCHE AUTOBANDENFABRIEK, VREDESTEIN (NETHERLANDS).
Brown (Dayton T.), Inc., Bohemia, N.Y.Testing Labs. Div.
For primary bibliographic entry see Field 13F.
PB-195 130 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). THE ARMSTRONG RUBBER COMPANY.
Compliance Testing, Inc., Ravenna, Ohio.
For primary bibliographic entry see Field 13F.
PB-195 131 HC$3.00 MF$0.65

REFLECTOR ANALYSIS,
Century Research Corp., Arlington, Va.
Kenneth G. Cook. Aug 69, 265p* DOT-HS-800 302
Contract FH-11-6950

Descriptors: (*Motor vehicles, *Reflectors), Reflective coatings, Reflectors, Mathematical prediction, Thresholds (Perception), Distance, Brightness, Color, Motor vehicle accidents, Visual perception, Angles (Geometry), Evaluations, Traffic safety.
Identifiers: Reflex reflectors, Field tests.

The report discusses the development history, technical background, and various specific proposals for the two major types of reflective treatments namely, paint and reflex reflectors, to increase visibility of vehicles. An analytic method for assessing the value of reflex reflectors is presented, and data from the application of such a method to two types of reflex reflectors are summarized. Field observations used to check the analytic calculations are described. (NHSB abstract)
PB-195 176 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 202 (HEAD RESTRAINTS). CHRYSLER CORPORATION 1970 DODGE CORONET.
General Testing Labs., Inc., Springfield, Va.
For primary bibliographic entry see Field 13F.
PB-195 202 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). THE ARMSTRONG RUBBER COMPANY.
Ogden Technology Labs., Inc., Monterey Park, Calif.
For primary bibliographic entry see Field 13F.
PB-195 203 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 105 (BRAKES). FORD MOTOR COMPANY 1970 MERCURY MONTEREY.
Dynamic Science Phoenix, Ariz. AvSER Facility.
For primary bibliographic entry see Field 13F.
PB-195 204 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). COOPER TIRE AND RUBBER COMPANY.
Compliance Testing, Inc., Ravenna, Ohio.
For primary bibliographic entry see Field 13F.
PB-195 205 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). DENMAN RUBBER MANUFACTURING COMPANY.
Compliance Testing, Inc., Ravenna, Ohio.
For primary bibliographic entry see Field 13F.
PB-195 206 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). THE FIRESTONE TIRE AND RUBBER COMPANY.
Compliance Testing, Inc., Ravenna, Ohio.
For primary bibliographic entry see Field 13F.
PB-195 207 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). THE WEATHERHEAD COMPANY.
Ogden Technology Labs., Inc., Monterey Park, Calif.
For primary bibliographic entry see Field 13F.
PB-195 208 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). THE FIRESTONE TIRE AND RUBBER COMPANY.
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
For primary bibliographic entry see Field 13F.
PB-195 209 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). THE GATES RUBBER COMPANY.
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
For primary bibliographic entry see Field 13F.
PB-195 210 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). KELLY-SPRINGFIELD TIRE COMPANY.
General Testing Labs., Hartwood, Va. Vehicular Lab.
For primary bibliographic entry see Field 13F.
PB-195 211 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). PIRELLI S. P. A. (ITALY).
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
For primary bibliographic entry see Field 13F.
PB-195 212 HC$3.00 MF$0.65

DOOR LOCKING SYSTEMS STUDY.
American Machine and Foundry Co., Santa Barbara, Calif. Advanced Systems Lab.
For primary bibliographic entry see Field 13F.
PB-195 222 HC$3.00 MF$0.65

STUDY OF BUS SIDE WINDOWS,
All American Engineering Co., Wilmington, Del.
For primary bibliographic entry see Field 13F.
PB-195 231 HC$3.00 MF$0.65

MULTIDISCIPLINARY ACCIDENT INVESTIGATION CASE NO. 1164D. HEADON COLLISION.
Vehicle collision rept.
California Univ., Los Angeles. UCLA Trauma Research Group.

Aug 70, 83p DOT-HS-600 260
Contract FH-11-6690

Descriptors: (*Motor vehicle accidents, *Accident investigations), Collision research, Judgment, Velocity, Roads, Curvature, Stability, Impact, Injuries, Death.
Identifiers: *Automobile collisions, Head on collisions, Young male drivers, Speeding, Road curves.

The head-on collision occurred on a Friday at 3:40 p.m. on a four-lane, undivided rural highway in California. Vehicle 1 was traveling faster than the posted speed; when it entered a curve and came upon vehicle 2 traveling too slow for the highway conditions. To prevent a rear end collision car 1 swerved but in so doing impacted with vehicle 3 traveling in the opposite direction.
PB-195 232 HC$3.00 MF$0.65

MULTIDISCIPLINARY ACCIDENT INVESTIGATION CASE NO.1266D. CAR, ROLLOVER/FIXED OBJECT IMPACT.
Vehicle collision rept.
California Univ., Los Angeles. UCLA Trauma Research Group.

Aug 70, 77p DOT-HS-600 264
Contract FH-11-6690

Descriptors: (*Motor vehicle accidents, *Accident investigations), Collision research, Judgment, Loads (Forces), Automobile tires, Velocity, Stability, Impact, Injuries.
Identifiers: *Rollover accidents, Fixed object collisions, Automobile collisions, Overloaded automobiles.

The combination rollover and vehicle vs. fixed object collision occurred at 7:50 a.m. on an 8-lane, divided freeway in California. The collision was caused by driving an overloaded station wagon at high speed. The tire configuration (belted-bias with bias) also promoted an oversteer condition. (Author)
PB-195 233 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 202 (HEAD RESTRAINTS). FORD MOTOR COMPANY 1970 MERCURY MONTEGO.
General Testing Labs., Inc., Springfield, Va.
For primary bibliographic entry see Field 13F.
PB-195 234 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). THE DAYTON TIRE AND RUBBER COMPANY.
Ogden Technology Labs., Inc., Deer Park, N.Y. Test Lab.
For primary bibliographic entry see Field 13F.
PB-195 235 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). THE GOODYEAR TIRE AND RUBBER COMPANY.
Ogden Technology Labs., Inc., Deer Park, N.Y. Test Lab.
For primary bibliographic entry see Field 13F.
PB-195 236 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). LEE TIRE AND RUBBER COMPANY.
Ogden Technology Labs., Inc., Deer Park, N.Y. Test Lab.
For primary bibliographic entry see Field 13F.
PB-195 237 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). MANSFIELD TIRE AND RUBBER COMPNAY.
General Testing Labs., Inc., Springfield, Va.
For primary bibliographic entry see Field 13F.
PB-195 238 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 105 (BRAKES). BRITISH LEYLAND MOTORS 1970 AUSTIN AMERICA.
Brown (Dayton T.), Inc., Bohemia, N.Y. Testing Labs. Div.
For primary bibliographic entry see Field 13F.
PB-195 239 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 105 (BRAKES). GENERAL MOTORS CORPORATION 1970 PONTIAC TEMPEST.
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 240 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 202 (HEAD RESTRAINTS). FORD MOTOR COMPANY 1970 THUNDERBIRD.
General Testing Labs., Inc., Springfield, Va.
For primary bibliographic entry see Field 13F.
PB-195 241 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). THE ARMSTRONG RUBBER COMPANY.
General Testing Labs., Inc., Springfield, Va.
For primary bibliographic entry see Field 13F.
PB-195 242 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). LOCKHEED (ENGLAND).
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 243 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). THE WEATHERHEAD COMPANY.
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 244 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). THE WEATHERHEAD COMPANY.
Ogden Technology Labs., Inc., Deer Park, N.Y. Test Lab.
For primary bibliographic entry see Field 13F.
PB-195 245 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). THE WEATHERHEAD COMPANY.
Ogden Technology Labs., Inc., Deer Park, N.Y. Test Lab.
For primary bibliographic entry see Field 13F.
PB-195 246 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). THE WEATHERHEAD COMPANY.
Ogden Technology Labs., Inc., Deer Park, N.Y. Test Lab.
For primary bibliographic entry see Field 13F.
PB-195 247 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). THE WEATHERHEAD COMPANY.
Ogden Technology Labs., Inc., Deer Park, N.Y. Test Lab.
For primary bibliographic entry see Field 13F.
PB-195 248 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106 (HYDRAULIC BRAKE HOSES). THE WEATHERHEAD COMPANY.
Ogden Technology Labs., Inc., Deer Park N.Y. Test Lab.
For primary bibliographic entry see Field 13F.
PB-195 249 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 105 (BRAKES). BRITISH LEYLAND MOTORS.
Detroit Testing Lab., Mich.
For primary bibliographic entry see Field 13F.
PB-195 250 HC$3.00 MF$0.65

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). UNIROYAL, INCORPORATED.
Ogden Technology Labs., Inc., Deer Park, N.Y. Test Lab.
For primary bibliographic entry see Field 13F.
PB-195 251 HC$3.00 MF$0.65

13M. Structural Engineering

FIELD TEST OF A STEAM CONDENSER HEAT SINK CONCEPT,
Cold Regions Research and Engineering Lab Hanover N H
William F. Quinn, Haldor W. C. Aamot, ar[4]
Marcus Greenberg. 1970, 15p

Descriptors: (*Underground structures, Heat sinks), (*Power plants (Establishments), Steam condensers), Metamorphic rock, Thermal analysis, Temperature, Periodic variations, Heat transfer, Predictions, Feasibility studies.
Identifiers: Hardened installations.

The report describes field tests performed to determine the feasibility of using mine tunnels as a heat sink for the disposal of turbine exhaust steam.
AD-713 572 HC$3.00 MF$0.65

DYNAMIC SHEAR STRENGTH OF REINFORCED CONCRETE BEAMS. PART III.
Final rept. Jul 66-Nov 68,
Naval Civil Engineering Lab Port Hueneme Calif
Richard H. Seabold. Sep 70, 187p Rept no. NCEL-TR-695
See also Part 2, AD-644 823.

Descriptors: (*Reinforced concrete, Shear stresses), (*Beams (Structural), Loading (Mechanics)), Stresses, Strain (Mechanics), Compressive properties, Flexural strength, Yield point, Web beams.

Theoretical and experimental work was done to study shear and diagonal tension in rectangular, reinforced concrete beams on simple supports and subjected to uniformly distributed dynamic and static loads. The objective was to determine criteria for the minimum amount of web reinforcement required for developing the ultimate flexural resistance of beams, and to determine the difference between these criteria for static and dynamic loading. The main portion of the experiment work consisted of testing 53 beams; 29 were loaded dynamically and 24 were loaded statically. Emphasis was placed on effectiveness of web reinforcement; 47 beams contained web reinforcement and six had none. All of the beams were tested in the NCEL blast simulator. Static loads were applied using compressed air, and dynamic loads were applied using the expanding gas from detonation of Primacord explosive. All of the beams were slender, and all of them were rectangular except 10 that were I-shaped. It was found that the shear and the shear strength in the beams were greaterunder dynamic load than under the same amount of load applied statically. Furthermore, it was found that a beam with enough web reinforcement to force flexural failure under static loading might not have enough to force flexural failure under dynamic loading. The theory was found to predict behavior up to the usable ultimate shear strength within normal engineering accuracy, and to provide a fair estimate of the time, location, and mode of failure. (Author)
AD-713 659 HC$3.00 MF$0.65

NONLINEAR MATERIAL AND GEOMETRIC BEHAVIOR OF SHELL STRUCTURES.
Brown Univ Providence R I Div of Engineering
For primary bibliographic entry see Field 20K.
AD-713 797 HC$3.00 MF$0.65

EARTHQUAKES AND NUCLEAR POWER PLANT DESIGN,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 18E.
For abstract, see NSA 24 20.
ORNL-NSIC-28 HC$3.00 MF$0.65

FIELD INVESTIGATION OF A CONTINUOUS COMPOSITE PRESTRESSED I-BEAM HIGHWAY BRIDGE LOCATED IN JEFFERSON COUNTY, ILLINOIS.
Civil engineering studies,
Illinois Univ., Urbana. Dept. of Civil Engineering.
W. L. Gamble. Jun 70, 135p Structural Research Ser-360
Report on Illinois Cooperative Highway Research Program, Progress Report no. 5. Prepared in cooperation with Bureau of Public Roads, Washington, D.C.

Descriptors: (*Highway bridges, Beams (Supports)), (*Prestressed concrete, I beams), Camber, Shear strain, Strain measurement, Seasonal variations, Dynamic loads, Creep properties, Shrinkage, Illinois.

Measurements of camber and strain in a prestressed concrete highway bridge were made over a period of 3.3 years. The bridge was made using precast, pretensioned I-beams which were made continuous for live-loads by reinforcement in the cast-in-place deck. The initial camber of about one in. in 72-ft span girders increased by about 75 percent within the first few weeks after release, and then changed only slowly. Only minor movements have occurred since the deck was cast. The same general trends have been observed in the strain measurements, with only small changes occurring after about two years. The shortening of the girders has amounted to slightly over one-in., in addition to temperature effects. Strain measurements on the bridge and on creep and shrinkage specimens indicate that the concrete undergoes expansion and contraction on an annual cycle, apparently in response to the increased average relative humidity during the winter months and the lower humidity during the summer. (Author)
PB-194 890 HC$3.00 MF$0.65

ANALYSIS OF SLAB-STRINGER-DIAPHRAGM SYSTEMS.
Final rept. Part 3,
North Carolina State Univ., Raleigh. Highway Research Program.
Donald L. Dean. Jun 70, 73p
Report on A Theoretical Study to Develop Rational Formulas for the Prediction of Load Distribution in Bridge Floor Systems. Prepared in cooperation with North Carolina State Highway Commission and Bureau of Public Roads, Washington, D.C. See also Part 1, PB-180 259.

Descriptors: (*Highway bridges, Loads (Forces)), Metal plates, Ribs (Supports), Mathematical models, Flexural strength, Composite beams, Fourier series, Shear properties, Slabs, Joists, Diaphragms (Mechanics).

Exact solutions are found for rationally based mathematical models for rectangular slab-stringer-diaphragm bridge floor systems with simple end supports and flexible side supports. The formulas are valid for general loadings and are improvements over those based on the empirical 'equivalent orthotropic continuum' and/or the approximate finite element method. The solutions are in the form of double Fourier series that are infinite with respect to the continuous variable along the stringer-slab contact lines and finite with respect to the discrete variable denoting the stringer. An exact macro discrete field approach is used. The mathematical models are summation-integral equations for the unknown discrete-continuous fields of interactive forces. (Author)
PB-194 932 HC$3.00 MF$0.65

RENOVATION OF HIGHWAY BRIDGES IN WEST VIRGINIA,
West Virginia Univ., Morgantown. Dept. of Civil Engineering.
Thavorn Anothayanontha, Dennis H. Parr, and Emory L. Kemp. 1970, 136p CES-2009

Descriptors: (*Truss bridges, Renovating), Loads (Forces), Deformation, Construction joints, Cables (Ropes), Deflection, Reinforcement (Structures), Force, Saddles (Supports), West Virginia.

The intent of this research is to investigate the possibility of increasing the capacity of older truss bridges. The system investigated was that of using stayed cables to assist the existing truss. The equations chosen for analyzing the new truss system are known as the equations of consistent deformations. The boundary condition is that the final displacement at each of certain joints is equal to the strain compatability of the cables. The final scheme is a structural system using three cables for each truss with a tower height of 15 feet above the top chord of the truss. Using this system it was shown that every member of the existing truss is presently sufficient for carrying the heavier loading. It was also determined that the cost of construction is reasonable for this type of renovative system. The general scheme which has been presented in this paper could be used for practically any type of truss bridge. (Author)
PB-194 951 HC$3.00 MF$0.65

STRENGTH AND STIFFNESS OF STEEL DECK SUBJECTED TO IN-PLANE LOADING.
Final rept.,
West Virginia Univ., Morgantown. Dept. of Civil Engineering.
Duane S. Ellifritt, and Larry D. Luttrell.1970, 163p* CES-2011
Sponsored by Steel Deck Inst., Chicago, Ill.

Descriptors: (*Floors, Loads (Forces)), Diaphragms (Mechanics), Panels, Ribs (Supports), Shear stress, Corrugating, Joists, Joining, Welded joints, Mathematical models.

An investigation was undertaken for the purpose of evaluating the performance of wide, narrow, and intermediate rib decks when used as shear-resistant diaphragms in buildings. The results of over one hundred full-scale tests are reported herein. The tests were conducted with various conditions of panel properties, purlin spacing, and fastener type and arrangement. Empirical curves are developed depicting shear strength and stiffness in

terms of the most significant variables. These are checked against a theoretical solution which treats one panel flute as an eccentrically loaded, elastically restrained column between purlins. Design charts are given for diaphragm strength and stiffness with modification factors to account for the most common methods of deck installation. Finally, suggestions are offered for ways in which the quality of field welding of diaphragms may be evaluated. (Author)
PB-194 952 HC$3.00 MF$0.65

DESIGN PROCEDURE COMPARED TO FULL-SCALE TESTS OF DRILLED SHAFT FOOTINGS.
Research rept.,
Texas Transportation Inst., College Station.
Don L. Ivey, and Wayne A. Dunlap. Feb 70, 172p
RR-105-3
Prepared in cooperation with the Bureau of Public Roads, Washington, D.C.

Descriptors: (*Footings, Loads (Forces)), Design, Soil mechanics, Soil classification, Soil properties, Shear stress, Predictions, Numerical analysis, Cost effectiveness.

A theory which will predict the ultimate resistance of a drilled shaft footing to overturning loads was presented in Research Report 105-1 and was correlated with model tests reported in Research Report 105-2. In this paper the results of full-scale tests on drilled shaft footings are presented and compared to a 'Tentative Design Procedure' based on the previously published theory. Design curves are given as a part of the design procedure, which result in easy application of the theory. Also included is an example problem and a section on estimating the soil parameters necessary for the design of these footings. The results of this study have now reached the stage where full implementation can be achieved. (Author)
PB-194 953 HC$3.00 MF$0.65

EFFECT OF AXIAL FORCE ON THE ULTIMATE LOAD CARRYING CAPACITY OF TWO PINNED STEEL ARCHES,
West Virginia Univ., Morgantown. Dept. of Civil Engineering.
Shanker S. Agarwal, and Dennis H. Parr. 1970, 84p
CES-2008

Descriptors: (*Arch trusses, Loads (Forces)), I beams, Elastic theory, Plastic theory, Axial strain, Axial stress, Collapse, Pressure, Destructive tests.

The object of this study was to investigate the effect of axial force on the load carrying capacity of two pinned steel arches. Methods have been presented to estimate the collapse load based on simple plastic theory considering the axial force influence. In caxes where the geometry of the arch and the loading condition is simple, the expression can be conveniently solved and the simple plastic theory collapse load determined. In other cases, a graphical method for solution is more convenient. An estimate of collapse load has been made by reducing the simple plaxtic theory collapse load for the effect of axial force. To verify the theoretical investigations, a series of tests were performed on two-pinned circular steel arch specimens of I cross section with low rise-to-span ratios. (Author)
PB-194 981 HC$3.00 MF$0.65

EFFECT OF GEOMETRY CHANGE ON THE ULTIMATE LOAD CARRYING CAPACITY OF TWO-PINNED STEEL ARCHES,
West Virginia Univ., Morgantown. Dept. of Civil Engineering.
John A. Rollyson, and Dennis H. Parr. 1970, 87p
CES-2010

Descriptors: (*Arch trusses, Loads (Forces)), I beams, Collapse, Pressure, Plastic theory, Deflection, Axial strain, Axial stress, Destructive tests.

The intent of this research was to investigate the effects of change in geometry on the load carrying capacity of two-pinned steel arches. For two-pinned arches, methods have been presented to determine the collapse load considering simple plastic theory, simple plastic theory modified for effects of axial force, and simple plastic theory modified for combined effects of axial force and change in geometry. Methods have also been presented to determine deflections due to bending and due to axial force. Using relatively large scale, two-pinned circular steel arches of I cross-section, experimental tests were performed to verify the theoretical considerations of this study. (Author)
PB-194 982 HC$3.00 MF$0.65

THE BEHAVIOR OF T- AND L- SHAPED PLAIN AND REINFORCED CONCRETE BEAMS LOADED IN TORSION,
West Virginia Univ., Morgantown, Dept. of Civil Engineering.
Paul R. Evans, Emory L. Kemp, and William J. Wilhelm. 1970, 140p CES-2006
Sponsored in part by the National Science Foundation, Washington, D.C.

Descriptors: (*Beams (Supports), Torsion), T beams, Reinforced concrete, Torgue, Torsion tests, Bending, Loads (Forces), Structural analysis, Torsional strength, Strain gages, Prestressed concrete.
Identifiers: L beams.

The object of this study is the development of equations and conditions which will describe the behavior of plain and reinforced concrete T- and L-shaped members loaded in pure torsion. Of primary interest are prediction equations for: (1) cracking torque, (2) ultimate torque, (3) initial torsional stiffness, (4) post-cracking torsional stiffness. Information of a supplementary nature is sought on: (1) the portion of an overhanging flange which may be considered effective in contributing to the cracking torque capacity, (2) the balanced steel percentage which will cause the torque-twist curve to flat top, or just maintain its cracing torque through large rotations. It is intended that guidelines for design be established where possible for each of the major categories considered.
PB-194 988 HC$3.00 MF$0.65

BEHAVIOR OF PRESTRESSED CONCRETE RECTANGULAR MEMBERS SUBJECTED TO PURE TORSION,
West Virginia Univ., Morgantown. Dept. of Civil Engineering.
Harish Chander, Emory L. Kemp, and William J. Wilhelm. 1970, 159p CES-2007
Sponsored in part by National Science Foundation, Washington, D.C.

Descriptors: (*Beams (Supports), Torsion), Reinforced concrete, Rectangular bodies, Torsion tests, Torsional strength, Structural analylis, Cracking (Fracturing), Prestressed concrete.

The object of this study is to investigate the behavior and strength of concentric and eccentric prestressed rectangular specimens subjected to pure torsion. Special emphasis is placed on: (a) the effect of the degree of prestress and the amount of reinforcement on the strength and rotational capacity, (b) the effect of eccentricity of prestressing force and the position of prestressing cables on strength and stiffness, (c) the effect of the transfer length for pre-tensioned members on strength and stiffness, (d) the variation, if any, between cracking strength of plain prestressed and reinforced prestressed specimens, (e) the difference in strength and behavior of bonded and unbonded specimens, and (f) the formulation of suitable prediction equations for initial stiffness and strength of prestressed specimens.
PB-194 989 HC$3.00 MF$0.65

FEASIBILITY OF A STABILIZATION-RETENTION BASIN IN LAKE ERIE AT CLEVELAND, OHIO.
Havens and Emerson, Cleveland, Ohio.
For primary bibliographic entry see Field 13B.
PB-195 083 HC$3.00 MF$0.65

EVALUATION OF A SINGLE LAYERED GRADED GRAVEL AS A PROTECTIVE FILTER.
Completion rept. 1 Jul 69-30 Jun 70,
Missouri Water Resources Research Center, Columbia.
Clifford D. Muir, and William C. Shen. 27 Aug 70, 101p W71-00413, OWRR-A-028-MO (2)
Contract DI-14-31-0001-3025

Descriptors: (*Slope protection, Fluid filters), (*Embankments, Erosion), (*Roads, Embankments), Gravel, Penetration, Design, Thickness, Probability, Correlation techniques, Statistical data, Tests, Feasibility.

A laboratory study was conducted to evaluate the feasibility of using a random graded single layer of gravel as a protective filter against embankment erosion due to seepage. This evaluation was based on the observation of movement of particles from a fine sand layer into filters with considerable variation in gradation. Also varied were the quantity and direction of flow. Forty one tests gave over six hundred individual penetration depths. These tests indicated that an increased thickness of filter layer can be used to replace fineness of gradation. Correlation between penetration depths for all gradations was obtained using an approximated average hydraulic radius for each filter. The data on penetration patterns and relationships between penetration depth and average hydraulic radius should be helpful in the design of a random graded single layer protective filter. (Author)
PB-195 084 HC$3.00 MF$0.65

THICKNESS OF SOIL SOLUM AS A PARAMETER OF PLANTAVAILABLE WATER STORAGE CAPACITY IN SOILS UNDERLAIN BY CARBONATE ROCKS.
Missouri Water Resources Research Center, Columbia.
For primary bibliographic entry see Field 8H.
PB-195 085 HC$3.00 MF$0.65

LOAD PARTITION AND ULTIMATE STRENGTH OF SHINGLE JOINTS.
Research rept.,
Lehigh Univ., Bethlehem, Pa. Fritz Engineering Lab.
Ulise Rivera, and John W. Fisher. Apr 70, 78p
FEL-340.6

Descriptors: (*Joints (Junctions), Dynamic loads), (*Highway bridges, Joints (Junctions)), Bolted joints, Riveted joints, Lap joints, Shear strength, Shear stress, Equilibrium methods, Destructive tests, Mechanical tests.
Identifiers: Shingle joints.

This report summarizes the results of tests to failure of two large structural shingle joints of A572 steel. One joint was fastened with A325 bolts and the other with A502 Gr. 1 rivets. An elastic analysis of the load partition is also described. The ultimate strength and distribution of force in the joints was ascertained. The results of the two joints were compared since their joint geometry was the same. Only the type of fastener differed. The test results indicated that at every load level the riveted joint exhibited greater flexibility than the bolted joint. The bolted joint was 27% stronger than the riveted joint. The average shear strength of the bolted joint at ultimate load was 60% of the shear strength of a single bolt. The riveted joint failed when the average shear stress was 80% of the shear strength of a single rivet. (Author)
PB-195 141 HC$3.00 MF$0.65

SETTLEMENT BEHIND BRIDGE ABUTMENTS. THE PERFORMANCE OF A UNIFORMLY-GRADED SAND FILL IN AN APPROACH EMBANKMENT ON THE M4 MOTORWAY,
Road Research Lab., Crowthorne (England).
J. E. Cross. 1970, 20p RRL-LR310

Descriptors: (*Embankments, Performance), (*Bridge abutments, Settlements (Structural)), Sands, Earth fills, Construction, Standards, Compacting, Surfaces, Roads, Great Britain.

The Report describes an investigation which is one of a series to determine whether it is necessary to place restrictions on the types of fill material to be used in constructing approach embankments behind bridge abutments. In this investigation the use of a uniformly-graded fine to medium sand was examined and compared with the performance of a well-graded sandy gravel. Measurements were made of the state of compaction of the fill materials and records obtained of the settlements of the road surface and the subsoil. After four years the settlements within both the 7 m high sand and gravel fills were negligible (of the same order as the accuracy of measurement). However settlements of up to 40 mm were recorded in the subsoil beneath the fill materials due to consolidation of the underlying clay. (Author)
PB-195 192 HC$3.00 MF$0.65

A STUDY OF COMFORT, HEALTH AND LEARNING IN SCHOOLS WITH DIFFERING THERMAL CONDITIONS.
Dunlap and Associates, Inc., Darien, Conn.
For primary bibliographic entry see Field 6N.
PB-195 257 HC$3.00 MF$0.65

SELECTION OF MATERIALS FOR SUB-SURFACE DRAINS,
Road Research Lab., Crowthorne (England).
R. Spalding. 1970, 42p RRL-LR346

Descriptors: (*Underground drains, Materials), (*Roads, Drainage), Pipes (Tubes), Construction materials, Fluid filters, Soils, Groundwater, Permeability, Porosity, Clay soils, Silts, Great Britain.

The report discusses the part played by the various components of a sub-surface drain in achieving adequate permeability and in preventing clogging of the drain by silt. Present criteria for the grading limits of the backfill and the porosity of the pipes in a drain are reviewed. (Author)
PB-195 258 HC$3.00 MF$0.65

FOUNDATION INSTRUMENTATION AT PLEASANT VALLEY PUMPING PLANT,
Bureau of Reclamation, Denver, Colo. Office of Chief Engineer.
William H. Roth. Jul 70, 40p REC-OCE-70-23

Descriptors: (*Foundations, Drainage), (*Measuring instruments, *Soils), Pore pressure, Piezometers, Drains, Stability, Walls, Safety factor, Stress concentration, California.
Identifiers: Pleasant Valley Pumping Plant (California).

Stress meters and piezometers were installed at Pleasant Valley pumping plant in California to record soil and pore pressures underneath and along the back wall of the structure and to monitor functioning of a drain that was constructed along the base of the back wall to reduce uplift pressure under the structure and horizontal pressure on the wall. Included in the report are: a discussion of conditions prompting the drain and instrumentation installation; drawings showing features of the pumping plant and pumping plant excavation; drawings showing locations and details of installation of the stress meters and piezometers; logs of drill holes showing foundation conditions; a description and drawings showing results of an electrical analogy tray study to determine the flow net for the high cut slope adjacent to the pumping plant; a discussion and drawings showing results of stability studies made for the structure; plots showing piezometer reading and stress meter through Feb 2 and Feb 12, 1970, respectively; plots of wall pressures determined from the stress meter readings; and a discussion of unexpected stress meter and piezometer readings and possible explanations. (Author)
PB-195 272 HC$3.00 MF$0.65

14. METHODS AND EQUIPMENT

14A. Cost Effectiveness

HISTORICAL SIMULATION: A PROCEDURE FOR THE EVALUATION OF ESTIMATING PROCEDURES. VOLUME I. PROCEDURE DEVELOPMENT AND DESCRIPTION.
General Research Corp Santa Barbara Calif
For primary bibliographic entry see Field 12B.
AD-713 174 HC$3.00 MF$0.65

14B. Laboratories, Test Facilities, and Test Equipment

DESCRIPTION OF A NOZZLE TEST FACILITY.
Final rept.,
Aerospace Research Labs Wright-Patterson AFB Ohio
Brian Quinn, Charles N. Eastlake, and Richard B. Fancher. Aug 70, 53p* Rept no. ARL-70-0140

Descriptors: (*Test facilities, Unconventional nozzles), (*Unconventional nozzles, Thrust), Mechanical properties, Deflection, Loading (Mechanics), Calibration, Accuracy.

The mechanical properties of a facility designed to study the characteristics of hybrid nozzles are described. Castigliano's method is used to analyze the deflection and load relationship of the rigid but elastic system. Experiments substantiate the analysis and confirm the capability for measuring nozzle thrust with a high degree of precision. The second part of the report describes tests with a family of axisymmetric nozzles. Also included is a detailed statement of calibration and testing procedures and an assessment of the total system accuracy. (Author)
AD-713 130 HC$3.00 MF$0.65

SIMULATION WITH MINIMUM EQUIPMENT OF RANDOM VIBRATION INDUCED BY COMPLEX EXCITATION.
Houston Univ Tex Dept of Mechanical Engineering
For primary bibliographic entry see Field 20K.
AD-713 141 HC$3.00 MF$0.65

EARTH ENVIRONMENTAL NOISE FIELDS.
Air Force Cambridge Research Labs L G Hanscom Field Mass
For primary bibliographic entry see Field 17G.
AD-713 172 HC$3.00 MF$0.65

TAETIGKEITSBERICHTE 1969. FAHGEBIET 6: FLUGRAUMPHYSIK, RAUMSIMULATION, FLUGMEDIZIN (Activity Report 1969. Division 6: Space Flight Physics, Space Simulation, Flight Medicine),
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Porz-Wahn (West Germany)
For primary bibliographic entry see Field 22A.
AD-713 212

RESEARCH DIRECTED TOWARD THE EXPERIMENTAL INVESTIGATION OF METHODS OF ANALYZING SO2:SO3 RATIOS IN JET EXHAUSTS.
Barkley and Dexter Labs Inc Fitchburg Mass
For primary bibliographic entry see Field 7D.
AD-713 222 HC$3.00 MF$0.65

FAR INFRARED SEALED LIQUID CELL WITH POLYETHYLENE WINDOWS,
Brown Univ Providence R I Dept of Chemistry
For primary bibliographic entry see Field 20F.
AD-713 240

HUR KAN SKOGSINDUSTRINS KOLLEKTIVA FORSKNING BIDRA TILL FORSKNINGS- OCH UTVECKLINGSARBETET INOM DET INSTRUMENTTEKNISKA OMRADET (Contribution of Lumber Industry Research to Research and Development in the Instrumentation Field),
Svenska Traforskningsinstitutet Stockholm
Ingvar Jullander. 1969, 5p Rept nos. Meddelande 6, AD-1
Text in Swedish.
Availability: Pub. in TVF, v40 n2 p57-60 1969. No copies furnished.

Descriptors: (*Industrial research, *Wood), Instrumentation, Sweden.
Identifiers: Lumber industry.

Advantages of informal cooperation between researchers in private companies and research agencies.
AD-713 348

SPECIMEN DAMAGE CAUSED BY THE BEAM OF THE TRANSMISSION ELECTRON MICROSCOPE, A CORRELATIVE RECONSIDERATION,
Armed Forces Inst of Pathology Washington D C
K. Stenn, and G. F. Bahr. 1 Oct 69, 26p
Availability: Pub. in Jnl. of Ultrastructure Research, v31 p526-550 1970.

Descriptors: (*Electron microscopes, Performance (Engineering)), (*Electron beams, Radiation damage), Electron microscopy, Radiation chemistry, Thermal properties.
Identifiers: Transmission electron microscopy.

The purpose of this paper is to review studies dealing with the damage to specimens by the beam with respect to the conditions of present-day routine electron microscopy and the results of radiation chemistry. The report tries to describe the alterations of matter produced by electron beams and to emphasize the important parameters influencing these alterations in the microscope. This discussion is directed primarily to the practicing electron microscopist who is interested in high resolution studies of organic and biochemical materials.
AD-713 358

RPC OF THE MONTH FROM THE AFIP,
Armed Forces Inst of Pathology Washington D C
For primary bibliographic entry see Field 6E.
AD-713 361

EXPLOSIVE ELECTROSTATIC SENSITIVITY TESTER, THE DESIGN, ASSEMBLY, AND OPERATION OF.
Technical memo.,
Naval Ordnance Lab White Oak Md
J. N. Ayres. 7 Feb 49, 16p Rept no. NOLM-9959

Descriptors: (*Electrostatic fields, Measuring devices (Electrical + electronics)), (*Explosive materials, Sensitivity), Design, Electric relays, Capacitors, Control panels, Wiring diagrams, Test methods.

The need has arisen in the Naval Ordnance Laboratory for an apparatus to measure the susceptibility of explosives and pyrotechnic materials to initiation by a static electrical spark discharge. By charging a known condenser to a known voltage, a calculable quantity of energy can be dissipated in a spark through an explosive sample. After some preliminary work at the Naval Ordnance Laboratory and after the inspection of the apparatus at the Bureau of Mines, it was decided to build an apparatus of the design presented. Although the basic circuit is quite simple, much care was taken to eliminate loss of charge that might arise from corona or surface leakage.
AD-713 397 HC$3.00 MF$0.65

A FLUERIC OSCILLATOR FOR MILITARY TIMER APPLICATIONS,
Harry Diamond Labs Washington D C
For primary bibliographic entry see Field 13G.
AD-713 514 HC$3.00 MF$0.65

A DETERMINISTIC VIEW OF SPECTRUM AND CROSS-SPECTRUM ANALYSIS,
Army Coastal Engineering Research Center Washington D C
For primary bibliographic entry see Field 8C.
AD-713 534 HC$3.00 MF$0.65

HOLOGRAPHIC INSPECTION OF LAMINATE BONDS,
Army Weapons Command Rock Island Ill
R. J. Iversen, J. W. McGarvey, and L. B. Gardner. 1970, 14p*

Descriptors: (*Laminates, *Non-destructive testing), Stereoscopic photography, Lasers, Metals, Rubber, Laminated plastics, Defects (Materials).
Identifiers: *Holography, Voids.

The paper discusses the holographic detection of bonding voids in rubber-to-metal, plastic-to-metal, and metal-to-metal laminates by observation of stress-induced deformations of the laminate surface. (Author)
AD-713 545 HC$3.00 MF$0.65

APPLICATION OF SENSING ARRAYS TO PHOTOGRAMMETRY AND METROLOGY,
Army Engineer Topographic Labs Fort Belvoir Va
For primary bibliographic entry see Field 8B.
AD-713 568 HC$3.00 MF$0.65

USE OF ACTIVATION ANALYSIS FOR DETERMINING WEIGHT OF PELLET IN M34 PRIMERS,
Army Materials and Mechanics Research Center Watertown Mass
Homer F. Priest, Forrest C. Burns, and Grace L. Priest. 1970, 13p

Descriptors: (*Primers, *Non-destructive testing), (*Radioactivation analysis, Non-destructive testing), Oxygen, Neutron reactions.
Identifiers: M-34 primers, *Neutron activation analysis.

The use of rapid fire weapons such as the minigun has focused attention on the problem of hangfires. From a study, it was concluded that low pellet weight in the M34 primer (more than 20% below specification) which is used in the minigun 7.62 mm. round, tends to produce cartridge hangfires due to insufficient output of hot gases and particles to adequately ignite the propellant charge. Methods were considered for 100% nondestructive quality assurance of the M34 primer pellet weight at a production rate in excess of 10 million per day. A 100% inspection of M34 primers for low pellet weight has been demonstrated to be feasible and specifications for an actual manufacturing quality assurance system have been developed based on activation analysis for oxygen in the pellet. (Author)
AD-713 571 HC$3.00 MF$0.65

A SHORT-RANGE DIGITAL TELEMETRY SYSTEM FOR REMOTE POSITIONING REGULATOR CONTROLLERS,
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 9F.
AD-713 616 HC$3.00 MF$0.65

TWO INDEPENDENT CALIBRATION METHODS USED IN TESTING LOW MASS FLOW RATE SENSORS IN ELECTROGASDYNAMIC FACILITIES.
Technical rept. Apr 63-Apr 66,
Air Force Flight Dynamics Lab Wright-Patterson AFB Ohio
D. W. Young. Aug 70, 53p Rept no. AFFDL-TR-70-60

Descriptors: (*Flowmeters, Calibration), (*Wind tunnels, Flowmeters), Mass transfer, Pressure gages.

Development of a system for measuring the mass flux profiles in an arc heated gasdynamic wind tunnel is described. Two independent calibration systems were developed for calibrating the low mass flow rate meter. One system is based on the pressure rise method and the other on the positive displacement technique. A combination mass flux and impact pressure probe was designed and utilized as a flow diagnostic instrument. The mass flux measuring system was capable of measuring rates of flow from .00000025 to .0004 pounds per second at test section simulated altitudes of 160,000 feet. Dynamic response of the flowmeter permitted continuous traverses of the core of the flow at speeds of 0.5 inch per second. Comparisons are made between mass flow rates as measured by the facility mass flowmetering system and those obtained by integrating the mass flux probe data. (Author)
AD-713 625 HC$3.00 MF$0.65

THE ROLE OF IMPACT TESTING IN CHARACTERIZING THE TOUGHNESS OF MATERIALS.
Technical rept.,
Army Materials and Mechanics Research Center Watertown Mass
William T. Matthews. Aug 70, 21p Rept no. AMMRC-TR-70-22
Availability: Pub. in Special Technical Publication 466, American Society and Testing Materials, p3-20 1970.

Descriptors: (*Impact tests, Reviews), (*Toughness, Test methods), Fracture (Mechanics), Thermal properties, Drop testing, Brittleness, Acceptability, Crack propagation, Loading (Mechanics), Transition temperature, Shear stresses, Army equipment.
Identifiers: Evaluation.

The objectives of fracture toughness testing are to provide information for design, screening, and acceptance of materials. Several tests are discussed in relation to an ideal design test possessing quantitativeness and generality: slow and impact-loaded fracture mechanics, conventional Charpy, and drop-weight tear testing (DWTT). The features and limitations of these methods are noted. Fracture is recommended for testing relatively brittle materials and DWTT and associated procedures as the best available for tough materials. Probable increased development in quantitative fracture mechanics including impact testing is discussed. For screening and acceptance, conventional Charpy testing is recommended provided that correlation with more basic tests has been established. (Author)
AD-713 649

A THERMOANEMOMETER FOR MEASURING THE TEMPERATURE, VELOCITY AND DIRECTION OF A GAS STREAM,
Army Foreign Science and Technology Center Washington D C
Yu. V. Karbe, and S. P. Takhuev. 14 Jan 70, 9p
Rept no. FSTC-HT-23-254-70
Trans. from Pribory i Sistemy Upravleniya (USSR) n11 p43-44.

Descriptors: (*Temperature sensitive elements, Design), Velocity, Gas flow, Portable, USSR.
Identifiers: Translations, *Thermoanemometers, EA-2 thermoanemometers.

A portable thermoanemometer of the EA-2 type, the sensing element of which consists of two semiconducting thermoresistors, type MMT-6 arranged in parallel with a fixed distance between axes, was developed for remote measurements of temperature, velocity and direction of a gas stream which is convenient for use under laboratory and factory conditions. (Author)
AD-713 664 HC$3.00 MF$0.65

BONDING AND CHEMICAL COMBINATION STUDIES USING THE ELECTRON MICROBEAM PROBE.
Technical rept. Oct 69-Feb 70,
Dayton Univ Ohio Research Inst
William L. Baun, and James S. Solomon. Aug 70, 38p AFML-TR-70-80
Contract F33615-69-C-1330
Presented at the Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (21st), Cleveland, Ohio, 3 Mar 70.

Descriptors: (*X-ray spectroscopy, Probes), Chemical bonds, Absorption, Terminal ballistics.
Identifiers: *Electron probes, Emission spectra.

The changes in x-ray emission spectra due to chemical combination may be used effectively with the electron microbeam probe to quickly identify compounds and alloy phases. To lessen the tedium of measuring small spectral changes and to improve precision, step scanning, and automatic data acquisition and handling techniques are used. Such a system is described and computer plotted spectra from hypervelocity impact specimens, oxidation specimens, and thin films are shown. Difficulties and limitations of the technique are discussed, such as carbon contamination and the changes in some spectra due to electron beam penetration changes which influence self-absorption. The self-absorption phenomenon may be taken advantage of, however, and it is shown that the computer can prepare self-absorption plots which closely approximate true absorption spectra. (Author)
AD-713 711 HC$3.00 MF$0.65

ADAPTERS FOR RAPID LOADING OF CUT FILMS FOR THE ELMISKOP ELECTRON MICROSCOPES,
Defence Standards Labs Adelaide (Australia)
For primary bibliographic entry see Field 14E.
AD-713 741

THE APPARENT TEMPERATURE AND EMISSIVITY OF NATURAL SURFACES AT MICROWAVE FREQUENCIES.
Kansas Univ., Lawrence. Center for Research.
For primary bibliographic entry see Field 20M.
AD-872 878 HC$3.00 MF$0.65

LABORATORY DIAGNOSIS OF CHOLERA,
Joint Publications Research Service, Washington, D.C.
Z. Ermoleva, and E. Vedmina. 20 Oct 70, 6p
Trans. from Meditsinskaya Gazeta (USSR) p3, 15 Sep 70.

Descriptors: (*Cholera, Diagnosis), (*Diagnosis, *Medical laboratories), Bacteria, Vibrio, Tests,

Detection, Identifying, Infectious diseases, Bacterial diseases, Isolation, Serology, Bacteriology, Cultures (Biology), Culture media.
Identifiers: Laboratory diagnosis.

Bacteriological diagnosis of cholera involves the isolation of a pure culture and the classification of it as a specific cholera vibrio, the establishment of the biotype (classical or El Tor), the serotype (Inaba, Ogava, Hikojima) and the phagotype. In spite of carefully worked out methods of isolation and identification of cholera vibrios, the cultivation capacity of the causative agent does not exceed 90 percent. Material for bacteriological investigation may include defacation and vomited matter from patients; material from cadavers (pieces of the small intestine and gall bladder) and, for investigation of a carrier, feces and bile or duodenal content. Water, food products, flies and objects contaminated by the patient may be used for the explanation of factors involving the spread of infection. The diagnosis of the disease is not the only purpose of the investigations. It is important to discover vibrio carriers among convalescents and contacts at breeding grounds, workers, food items, and children's institutes and to establish sources and pathways for the spread of the infection. Test methods for laboratory diagnosis of cholera are summarized.
JPRS-51605 HC$3.00 MF$0.65

DESIGN AND FABRICATION OF A THERMAL SCANNER,
Los Alamos Scientific Lab., N. Mex.
Karl L. Meier. Apr 70, 9p
Contract W-7405-eng-36

Descriptors: (*Temperature measuring instruments, Design), (*Fission products, Detection), Performance, Tests, Laboratory equipment, Nuclear fuel elements.
Identifiers: *Thermal scanners, Gas bubbles.

For abstract, see NSA 24 20.
LA-4453 HC$3.00 MF$0.65

TARGET-DESIGN AND DATA-REDUCTION CODES FOR THE ARLG GUN,
Los Alamos Scientific Lab., N. Mex.
J. N. Fritz, and J. A. Morgan. Jun 70, 30p
Contract W-7405-eng-36

Descriptors: (*Light gas guns, Targets), (*Impact tests, Data reduction), Shock waves, Numerical analysis, Computer programs, Equation of state.
Identifiers: *Accelerating reservoir light gas guns.

For abstract, see NSA 24 20.
LA-4481 HC$3.00 MF$0.65

CHARACTERISTICS OF LMEC ELECTRICAL RESISTANCE STRAIN GAGES UTILIZING ARMOUR D ALLOY,
Atomics International, Canoga Park, Calif. Liquid Metal Engineering Center.
M. M. Lemcoe. 30 Jun 70, 107p
Contract AT (04-3)-700

Descriptors: (*Strain gages, Performance evaluation), Fabrication, Iron alloys, Chromium containing alloys, Aluminum containing alloys.

For abstract, see NSA 24 20.
LMEC-70-8 HC$3.00 MF$0.65

ON THE MEASUREMENT TECHNIQUE FOR DETERMINING FINE DUSTS AND THEIR SEPARATION IN SPRAY WASHERS.
Ueber Die Messtechnische Bestimmung Von Feinststaeuben Und Deren Abscheidung in Spruehwaeschern
Eidgenossische Technische Hochschule, Zurich (Switzerland).
P. Eisen. 1969, 111p DISS-4228
Lang- in German

Descriptors: *Aerosols, *Particle size distribution, *Size separation, *Sprayers, Deposition, Dust, Particles, Spectrum analysis.

For abstract, see STAR 08 21.
N70-38346 HC$3.00 MF$0.65

A MILLIMETER WAVELENGTH INTERFEROMETER SPECTROMETER FINAL REPORT.
Block Engineering, Inc., Cambridge, Mass.
G. Wyntjes, and N. O. Young. 1966, 33p NASA-CR-75556
Contract NASA ORDER R-146, USGS-13009
Seri- Its Tech. Letter Nasa-15

Descriptors: *Geology, *Interferometers, *Millimeter waves, *Spectrometers, Aircraft instruments, Rocket-borne instruments, Satellite instruments.

For abstract, see STAR 08 21.
N70-38940 HC$3.00 MF$0.65

A STUDY OF DYNAMIC LOAD SIMULATORS FOR ELECTRICAL SYSTEMS TEST FACILITY FINAL REPORT, 29 DEC. 1969 - 30 JUN. 1970.
Avco Corp., Wilmington, Mass. Government Products Group.
K. P. Joncas. 17 Aug 70, 154p NASA-CR-108624, AVSD-0364-70-RR
Contract NAS9-10429

Descriptors: *Dynamic loads, *Dynamic response, *Electric equipment, *Simulators, Performance tests, Quality control.

For abstract, see STAR 08 21.
N70-38976 HC$3.00 MF$0.65

NEW TECHNIQUE FOR ULTRASONIC FLAW DETERMINATION BY SPECTRAL ANALYSIS,
Oak Ridge National Lab., Tenn.
H. L. Whaley, and Laszlo Adler. Sep 70, 40p*
Contract W-7405-eng-26

Descriptors: (*Nondestructive tests, *Ultrasonic tests), Spectrum analysis.

For abstract, see NSA 24 20.
ORNL-TM-3056 HC$3.00 MF$0.65

FRACTIONAL FRINGE HCN LASER-INTERFEROMETER,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 20F.
For abstract, see NSA 24 20.
ORNL-TM-3092 HC$3.00 MF$0.65

SPC-12 MASS SPECTROMETER ROUTINES: REAL TIME DATA ACQUISITION AND DATA REDUCTION FOR BENDIX T-O-F INSTRUMENTS,
Florida Univ., Gainesville.
M. B. Fallgatter, and R. J. Hanrahan. Mar 70, 21p
Contract AT (40-1)-3106

Descriptors: (*Mass spectroscopy, Computer programming), Data processing.
Identifiers: Time of flight mass spectroscopy.

For abstract, see NSA 24 20.
ORO-3106-33 HC$3.00 MF$0.65

DESIGN AND CONSTRUCTION OF A RADIATION PROBE.
Bureau of Mines, Washington, D.C.
For primary bibliographic entry see Field 20M.
PB-194 945 HC$3.00 MF$0.65

METHODS OF MEASUREMENT FOR SEMICONDUCTOR MATERIALS, PROCESS CONTROL, AND DEVICES.
National Bureau of Standards, Washington, D.C.
For primary bibliographic entry see Field 20L.
PB-194 961 HC$0.65 MF$0.65

BIBLIOGRAPHIES ON FABRIC FLAMMABILITY. PART 5. TESTING AND TEST METHODS.
National Bureau of Standards, Washington, D.C. Inst. for Applied Technology.
For primary bibliographic entry see Field 13L.
PB-195 028 HC$0.45 MF$0.65

OPTICAL MICROSCOPY AS APPLIED TO AIR POLLUTION STUDIES. A REFERENCE LIST,
National Air Pollution Control Administration, Cincinnati, Ohio.
James S. Ferguson, and Eleanor G. Sheridan. Mar 68, 15p APTD-68-3

Descriptors: (*Air pollution, *Particles), (*Microscopy, Air pollution), Bibliographies.
Identifiers: *Air pollution detection.

The bibliography is divided into two categories: (1) 45 general reference books and pamphlets for the review of basic material and for the development of ideas potentially applicable to airborne particulates and (2) 72 journal and symposia proceedings involving microscopy in various areas of interest, but primarily applicable to air pollution. (Author)
PB-195 149 HC$3.00 MF$0.65

DESIGN OF A SIMPLE PLANT EXPOSURE CHAMBER.
National Center for Air Pollution Control, Cincinnati, Ohio.
For primary bibliographic entry see Field 13B.
PB-195 151 HC$3.00 MF$0.65

REPORT OF NRL PROGRESS.
Naval Research Lab., Washington, D.C.

Sep 70, 49p
Also available on subscription $15.00/year domestic, $18.00/year foreign. See also rerport dated Aug 70, PB-194 037.

Descriptors: (*Naval research, Reviews), (*Electrical resistivity, Dimensions), Electron phonon interactions, Cryogenics, Acoustics, Electronics, Mathematics, Metallurgy, Optics, Radar equipment, Electrolytic etching.

Complete article: Influence of size effect on low-temperature electrical resistivity. Summaries are given of research in the following fields: acoustics, electronics, mathematics, metallurgy, optics, radar. Also, an abstract is included on electrolytic etching sputtered thin films of Pt, Pd, and Au.
PB-195 154 HC$3.00 MF$0.65

VOLTAGE RATIO DETECTOR FOR MILLIVOLT SIGNALS.
Technical note,
National Bureau of Standards, Washington, D.C. Inst. for Basic Standards.
J. R. Houghton. 13 Dec 65, 14p NBS-TN-266

Descriptors: (*Ratiometers, Signals), Voltage dividers, Vibration, Calibrating, Detectors.
Identifiers: Voltage ratio detectors.

A voltage ratio detector circuit for measuring ratios of a-c and d-c signals 5 millivolts or larger is described. The ratio is determined with a precision voltage divider which is accurate to within 0.001 percent of the indicated ratio when the ratio is near one. The detector has sufficient sensitivity and stability to indicate differences between two signals of 0.01 percent. Experimental results are presented to show the relative improvement in sensitivity of this voltage ratio detector over the previously used transfer admittance method for the calibration of vibration pickups. (Author)
PB-195 214 HC$3.00 MF$0.65

TECHNIQUES FOR MEASURING STRESS, STRAIN, AND RESISTIVITY AT 4 K FOR VERY SOFT MATERIALS,
National Bureau of Standards, Boulder, Colo. Cryogenics Div.
R. P. Reed, and V. D. Arp. 13 Jun 69, 3p NBS-R-590
Pub. in Cryogenics, v9 n5 p362-364 Oct 69.

Descriptors: (*Aluminum, Tensile properties), (*Measuring instruments, Cryogenics), (*Stresses, Measurement), (*Strains, Measurement), (*Electrical resistivity, Measurement).

Existing techniques for conducting low temperature tensile tests have not proven satisfactory for super pure aluminium due to its extreme softness. The desire to concurrently measure specimen resistivity during 4 K tests also provided experimental difficulties, since the specimens had to be electrically isolated from the metallic load assembly. The paper discusses these problems and describes the apparatus designed to provide sensitive and accurate data on stress, strain, and resistivity at 4 K. (Author)
PB-195 253

FOUNDATION INSTRUMENTATION AT PLEASANT VALLEY PUMPING PLANT,
Bureau of Reclamation, Denver, Colo. Office of Chief Engineer.
For primary bibliographic entry see Field 13M.
PB-195 272 HC$3.00 MF$0.65

SANDIA 500-KILOJOULE ARC-DRIVEN SHOCK TUBE FACILITY,
Sandia Labs., Albuquerque, N. Mex.
A. J. Mulac, J. L. Mark, and J. A. Guzman. Jun 70, 45p

Descriptors: (*Shock tubes, Design), Performance.

For abstract, see NSA 24 20.
SC-DR-70-217 HC$3.00 MF$0.65

FLUSH-MOUNTED ELECTROSTATIC PROBE IN THE PRESENCE OF NEGATIVE IONS,
Sandia Labs., Albuquerque, N. Mex.
K. J. Touryan, and P. M. Chung. Jul 70, 38p
Prepared in cooperation with Illinois Univ., Chicago.

Descriptors: (*Electrostatic probes, *Plasma diagnostics), (*Plasma sheaths, Anions), (*Reentry vehicles, Ion density (Concentration)), Tetrafluoroethylene resins, Boundary layer, Ion currents, Atmospheric electricity.

For abstract, see NSA 24 20.
SC-RR-70-413 HC$3.00 MF$0.65

MEASUREMENT CAPABILITIES OF THE SANDIA LABORATORIES, LIVERMORE, STANDARDS LABORATORIES,
Sandia Labs., Albuquerque, N. Mex.
J. L. Wilson. Aug 70, 28p
Supersedes Rept. no. SCL-DR-67-81.

Descriptors: (*Physics laboratories, *Metrology), Measuring instruments, Accuracy, Standards.
Identifiers: *Standards laboratories.

For abstract, see NSA 24 20.
SCL-DR-70-83 HC$3.00 MF$0.65

DYNAMICAL THEORY OF KIKUCHI ELECTRONS,
California Univ., Berkeley. Lawrence Radiation Lab.
T. Y. Tan. May 70, 4p CONF-701003-3
Contract W-7405-eng-26
Presented at the Meeting on Electron Microscopy Society of America (28th), Houston, Tex. Oct 70.
Descriptors: (*Electron microscopy, *Electron diffraction), Electron beams, Electron scattering, Spectral lines, Theses.
Identifiers: *Kikuchi effects, *Transmission electron microscopy.

For abstract, see NSA 24 20.
UCRL-19631 HC$3.00 MF$0.65

AN AUTOMATED, HIGH-SENSITIVITY, THREE-COLUMN GAS CHROMATOGRAPH,
California Univ., Livermore. Lawrence Radiation Lab.
Jack W. Frazer, Virgil Du Val, and Roger E. Anderson. 21 Apr 70, 15p*

Descriptors: (*Gas chromatography, Automatic control), Design.

For abstract, see NSA 24 20.
UCRL-50849 HC$3.00 MF$0.65

STATIC DETERMINATION OF THE DEFORMATIONAL PROPERTIES OF SOLID MATERIALS WITH PRESSURE,
California Univ., Livermore. Lawrence Radiation Lab.
A. G. Duba, and R. N. Schock. 16 Apr 70, 18p

Descriptors: (*Measuring instruments, Design), (*Static loads, Rocks), Granite, Limestone, Modulus of elasticity, Poisson ratio, Compressive properties, Iron, Glass, Pressure gages, Strain gages, Stress analysis, Cracking (Fracturing), Nuclear explosions, Underground explosions.
Identifiers: Armco iron, Pyrex glass, Solenhofen limestone, Westerly granite.

For abstract, see NSA 24 20.
UCRL-50852 HC$3.00 MF$0.65

METHOD FOR EVALUATION AND CERTIFICATION OF THE SIP TRIOPTIC UNIVERSAL MEASURING MACHINE,
California Univ., Livermore. Lawrence Radiation Lab.
Donald L. Lane. 21 Apr 70, 40p

Descriptors: (*Measuring instruments, Dimensional measurement), Machinery.
Identifiers: *Universal measuring machines.

For abstract, see NSA 24 20.
UCRL-50879 HC$3.00 MF$0.65

14C. Recording Devices

USE OF MAGNETIC TAPE FOR REPORTING COST INFORMATION,
Rand Corp Santa Monica Calif
For primary bibliographic entry see Field 5A.
AD-713 606 HC$3.00 MF$0.65

14D. Reliability

AN AD HOC BAYESIAN METHOD FOR DETERMINING LOWER CONFIDENCE LIMITS.
Naval Postgraduate School Monterey Calif
For primary bibliographic entry see Field 12A.
AD-713 075 HC$3.00 MF$0.65

CRAMER-RAO EFFICIENCIES OF BEST LINEAR INVARIANT ESTIMATORS OF PARAMETERS OF THE EXTREME-VALUE DISTRIBUTION UNDER TYPE II CENSORING FROM ABOVE,
Rocketdyne Canoga Park Calif Mathematics and Statistics Research Div
For primary bibliographic entry see Field 12A.
AD-713 314

14E. Reprography

VISUAL IDENTIFICATION OF PEOPLE BY COMPUTER.
Stanford Univ Calif Dept of Computer Science
For primary bibliographic entry see Field 9B.
AD-713 252 HC$3.00 MF$0.65

ADAPTERS FOR RAPID LOADING OF CUT FILMS FOR THE ELMISKOP ELECTRON MICROSCOPES,
Defence Standards Labs Adelaide (Australia)
H. R. Limb. 12 Dec 69, 2p
Availability: Pub. in Jnl. of Physics E: Scientific Instruments, v3 p658 1970. No copies furnished.

Descriptors: (*Photographic film, Electron microscopy), (*Photographic plates, Adapters), Metal plates, Sheets, Laboratories, Australia.
Identifiers: *Photographic plate holders.

Two alternative designs of a sheet metal adapter are described which make possible rapid loading of cut films into the plate holders provided for use in Siemens Elmiskop electron microscopes. (Author)
AD-713 741

THE BAYESIAN APPROACH TO IDENTIFICATION OF A REMOTELY SENSED ENVIRONMENT.
Kansas Univ., Lawrence. Center for Research.
For primary bibliographic entry see Field 8B.
AD-860 060 HC$3.00 MF$0.65

USE OF INFRARED IMAGERY AND COLOR PHOTOGRAPHY IN STUDY OF MISSILE IMPACT CRATERS.
Geological Survey, Washington, D. C.
For primary bibliographic entry see Field 8G.
For abstract, see STAR 08 21.
N70-38846 HC$3.00 MF$0.65

PRELIMINARY EVALUATION OF RADAR IMAGERY OF YELLOWSTONE PARK, WYOMING.
Geological Survey, Washington, D. C.
For primary bibliographic entry see Field 8G.
For abstract, see STAR 08 21.
N70-38847 HC$3.00 MF$0.65

BATTELLE INFORMATION NUMBER 1.
Battelle Inst., Frankfurt Am Main (West Germany).
For primary bibliographic entry see Field 20E.
For abstract, see STAR 08 21.
N70-38876 HC$3.00 MF$0.65

INFRARED INVESTIGATIONS STATUS REPORT, 1 JUL. - 30 SEP. 1966.
Geological Survey, Washington, D. C.
For primary bibliographic entry see Field 8F.
For abstract, see STAR 08 21.
N70-38883 HC$3.00 MF$0.65

15. MILITARY SCIENCES

15A. Antisubmarine Warfare

THE EFFECT OF FALSE CONTACTS ON THE PROBABILITY OF DETECTING A SUBMARINE.
Master's thesis,
Naval Postgraduate School Monterey Calif
Raymond Michael Walsh. Apr 70, 65p

Descriptors: (*Antisubmarine warfare, Sonar targets), (*Sonar targets, Accuracy), Antisubmarine aircraft, Helicopters, Submarines, Echo ranging, Sonar signals, Errors, Computer programs, War games, Theses.
Identifiers: Scenarios, False contacts, Sonar clutter.

A computer war game is developed to measure the effect of false contacts on the probability of detecting a submarine. The variables are the probability of correctly classifying a non-submarine contact, the probability of correctly classifying a submarine contact, and the false contact density. A scenario is developed to focus on the false contact problem while holding other ASW variables constant. It is concluded from the output of the game that the effect of false contacts is deeply embedded in the interrelationships between units. (Author)
AD-713 394 HC$3.00 MF$0.65

15B. Chemical, Biological, and Radiological Warfare

CONFORMATIONAL STUDIES ON THE ACTIVE SITE OF ACETYLCHOLINESTERASE BY ELECTRON PARAMAGNETIC RESONANCE,
Edgewood Arsenal Md
For primary bibliographic entry see Field 6A.
AD-713 563 HC$3.00 MF$0.65

15C. Defense

EVALUATION OF SYSTEMS OF FIRE DEVELOPMENT.
Stanford Research Inst Menlo Park Calif
For primary bibliographic entry see Field 15F.
AD-713 418 HC$3.00 MF$0.65

CLIMATE MODIFICATION AND NATIONAL SECURITY,
Rand Corp Santa Monica Calif
For primary bibliographic entry see Field 4B.
AD-713 428 HC$3.00 MF$0.65

15D. Intelligence

A MATHEMATICAL ANALYSIS OF THE PROPAGATION AND REFLECTION OF PLANE ELECTROMAGNETIC WAVES IN A NON-HOMOGENEOUS ISOTROPIC MEDIUM,
Army Engineer Topographic Labs Fort Belvoir Va
For primary bibliographic entry see Field 20N.
AD-713 539 HC$3.00 MF$0.65

15E. Logistics

INVESTIGATION OF LIGHTWEIGHT 40 INCH X 48 INCH WAREHOUSE AIR LIFT PALLET.
Technical rept. 1 Apr-30 May 70,
Aeronautical Systems Div Wright-Patterson AFB Ohio
Joseph L. Weingarten. Aug 70, 27p Rept no. ASD-TR-70-35

Descriptors: (*Pallets, Air transportation), (*Transport planes, Compatibility), Handling, Statistical analysis, Costs, Polyethylene plastics, Styrene plastics, Plywood, Cost effectiveness.

Current 40 inches x 48 inches warehouse wooden pallets procured under present military specifications are not compatible with air mode operations and air cargo handling equipment, due to roller transfer. The Tactical Air Command issued a Required Operational Capability to find a pallet that would be compatible with the air mode. This study compares various pallets to determine which pallet is most suitable to meet TAC's needs. (Author)
AD-713 102 HC$3.00 MF$0.65

THE TRANSPORTATION PROBLEM WITH OPTIMIZATION OF THE ORIGINS.
Themis optimization research program,
Texas A and M Univ College Station Inst of Statistics
A. P. Rainosek, and H. O. Hartley. Sep 70, 101p
Rept no. THEMIS-TR-25
Contract N00014-68-A-0140

Descriptors: (*Transportation, Operations research), Scheduling, Sequences, Set theory, Nonlinear programming, Linear programming, Partial differential equations, Algorithms, Optimization, Queueing theory, Costs, Combinatorial analysis.
Identifiers: Themis project, Service facilities, Location allocation problems.

The report presents solution procedures for two related location/allocation problems. Two algorithms which mathematically guarantee global optimality are described for the first problem which considers the optimal positioning of an origin set and associated optimal quotas given a known destination set. For the second problem which requires the optimal positioning of a 'serving center' set given a known origin set and destination set, an efficient exhaustive scanning procedure and a modified version of an algorithm given for the first problem are presented. Both of these techniques guarantee a global optimum. For large problems which have both limited capacities and geographic restritions placed on the optimal positioning of the serving centers, a two-phase iterative procedure not guaranteeing global optimality is described. Example problems are provided to illustrate selected algorithms. (Author)
AD-713 213 HC$3.00 MF$0.65

T-T INDICATING SYSTEMS,
Army Natick Labs Mass
K. H. Hu, and J. D. Loconti. 1970, 15p*

Descriptors: (*Storage, *Aging (Materials)), (*Chemical indicators, Aging (Materials)), (*Enzymes, Chemical indicators), Oxidation-reduction reactions, Temperature, Decomposition, Food, Drugs, Zinc, Air, Phosphoric acids, Colorimetric analysis.
Identifiers: *Perishable supplies, *Anthraquinones, *Iron chlorides, *Shelf life.

The original concept of developing T-T (time-temperature) indicating systems which can be related to product deterioration has been established and proven for several possible systems. The approach was that both useful life of a storage item and the amount of oxygen permeating a plastic film are exponential functions of temperature. By inclosing a suitable oxygen-reacting chemical system in a plastic pouch, the amount of reaction which occurs depends upon the amount of oxygen permeating the film which in turn is effectively controlled by time and temperature. The concept feasibility has been explored and proven through studies of the following four oxidizable chemical systems: The redox dye system, using an anthraquinone-zinc solution, has proven capable of conveying written messages to indicate the end of the useful life of a storage item; The inorganic system, through the color change in two stages of FeCl2-H3PO4 solution can also be used to convey information; Both anthraquinone-zinc and FeCl2-H3PO4 systems have been shown to be stable to light and heat; and The enzyme and rubber sheet systems also could be adopted for indicating time and temperature; however, their practical applications are limited to special situations. These studies have shown that the basic design concept provides excellent versatility. (Author)
AD-713 542 HC$3.00 MF$0.65

THE ISOTONIC REGRESSION PROBLEM AND ITS DUAL,
California Univ Berkeley Operations Research Center
For primary bibliographic entry see Field 12A.
AD-713 592 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: MAINTENANCE OF CLOTHING AND EQUIPMENT.
Research By-Product,
George Washington Univ Alexandria Va Human Resources Research Office
Jane V. Lee, Dennis J. Jarden, and Joseph A. Moody. Dec 68, 17p
Contract DA-44-188-ARO-2

Descriptors: (*Army equipment, Army training), (*Combat surveillance, Army training), (*Infantry, Leadership), Clothing, Maintenance, Warfare, Instruction manuals.
Identifiers: *Infantry rifle squad leaders.

The paper deals with the knowledges, skills, and performances required of the Infantry rifle squad leader to enable him to ensure the proper maintenance of clothing and equipment issued to his men, including special cold weather and tropical equipment, and the proper procedures for requesting replacement items. (Author)
AD-713 790 HC$3.00 MF$0.65

INTERIM-INPUT OUTPUT RESOURCE ALLOCATION MODEL,
Center for Naval Analyses, Arlington, Va.
J. H. Augusta, R. A. Jenner, and G. W. Ryhanych.
2 Mar 70, 32p CNA-Research Contrib-134
Contract N00014-68-A-0091
Distribution Limitation now Removed.

Descriptors: (*Naval operations, Costs), Marine Corps, Mathematical models, Naval equipment, Naval personnel, Military requirements, Armed forces budgets, Naval training, Maintenance, Armed forces transportation, Military facilities.
Identifiers: Realm (Resource Allocation Model), Resource allocation models, Force structure planning.

The research contribution describes the Interim CNA Input-Output Resource Allocation Model. The model is an 'input-output' model, which accounts for and allocates indirect operating costs created by the many interactions between Marine Corps units. The cost model provides 3 types of information. One, it provides direct operating cost for all Marine Corps organizations on the east coast, both Fleet Marine Forces (FMF), and non-FMF. Second, it allocates the operating costs of the support establishment (normally called indirect support costs) to the FMF units receiving the support. Third, it provides estimates of any specified change in the FMF upon the support establishments operating costs, and estimates the needed additional resources, including manpower, of the change. (Author)
AD-866 655 HC$3.00 MF$0.65

NAVAL FORCES AMPHIBIOUS ASSAULT BULK FUEL SYSTEM (AABFS)-LIGHTWEIGHT PIPE.
Naval Civil Engineering Lab., Port Hueneme, Calif.
For primary bibliographic entry see Field 13K.
AD-870 970 HC$3.00 MF$0.65

NATIONAL TRANSPORTATION PLANNING MANUAL (1970-1990). MANUAL A: GENERAL INSTRUCTIONS.
Department of Transportation, Washington, D.C.

Jul 70, 191p* BOB-004-S70028
Errata sheet inserted.

Descriptors: (*Transportation, Requirements), (*Planning, Transportation), (*Government policies, Transportation), Federal budgets, State government, Local government, Costs, Management planning, Demography, Statistical data, Financing, Urban areas, Rural areas, Manuals.
Identifiers: Capital improvements.

The manual has been prepared to guide elements of the federal government, the states, and local governments in preparing estimates of needs and capital improvement programs on consistently defined systems using uniform procedures. It is desired to achieve consistency in estimates between states and regions so that a comparison of needs as they may affect federal fiscal considerations may be made. The object is to provide reliable data upon which future transportation system responsibility and financing can be based. 1990 is specified as the horizon year but no special significance is associated with that year. (Author)
PB-194 964 HC$3.00 MF$0.65

NEW YORK STATE APPALACHIAN RESOURCE STUDIES: TRANSPORTATION. PHASE I. INVENTORY.
New York State Office of Planning Coordination, Albany.

1970, 98P
Sponsored in part by Department of Housing and Urban Development, Washington, D.C.

Descriptors: (*Resources, New York), (*Transportation, Inventories), (*Regional planning, *New York), Highways, Bus lines, Cargo transportation, Railroads, Passenger transportation, Mail, Commercial aircraft, Petroleum pipelines, Gas pipelines, Statistical data, Classifications.
Identifiers: Appalachian region, Counties.

A comprehensive plan for the New York Appalachian area involves a comprehensive study of resources in the area: agriculture, climate, community facilities, culture and recreation, forestry, industry, manpower, minerals, soils, transportation and water. The volume contains the first phase of a detailed inventory.
PB-195 024 HC$3.00 MF$0.65

15F. Nuclear Warfare

EVALUATION OF SYSTEMS OF FIRE DEVELOPMENT.
Final rept.,
Stanford Research Inst Menlo Park Calif
Leo W. Weisbecker, and Hong Lee. Aug 70, 88p
Contract DAHC20-67-C-0116

Descriptors: (*Nuclear explosions, Fires), (*Fires, Mathematical models), Propagation, Thermal radiation, Urban areas, Civil defense systems.
Identifiers: *Mass fires, *Fire spread, *Firebrands.

The report compares three fire spread models, recently developed for the Office of Civil Defense, for utility, accuracy, and efficiency when applied to civil defense fire information requirements. The fire spread modeling was essentially limited to the radiation fire spread mechanism. All three models provided procedures for calculating fire spread under a limited range of conditions, but all suffered to some degree from inadequate modeling of urban configurations and the fire parameters associated with urban structures that significantly affect fire spread mechanisms. (Author)
AD-713 418 HC$3.00 MF$0.65

15G. Operations, Strategy, and Tactics

TARGET ALLOCATION FOR FIELD ARTILLERY.
Naval Postgraduate School Monterey Calif
For primary bibliographic entry see Field 19E.
AD-713 078 HC$3.00 MF$0.65

COMBAT CASUALTIES AND MISSION ACCOMPLISHMENT,
Army Command and General Staff Coll Fort Leavenworth Kans
Wallen M. Summers. Mar 70, 57p

Descriptors: (*Army operations, *Casualties), Battle injuries, Infantry, Statistical data, History, Theses.

The study describes an academic reconnaissance in force conducted by selecting a sample of World War II rifle companies, determining their mission accomplishment and associated casualties, and analyzing the results statistically. This analysis reveals no indication of correlation between incidence of mission success and casualties. Since the study uses data at the small unit level, it is obvious that even though the Army as an institution holds assigned mission to be paramount, the individual commanders and leaders who are members of this institution do not actually behave accordingly. Such a 'reality gap' can have significant consequences. (Author)
AD-713 373 HC$3.00 MF$0.65

AIR CAVALRY IN PERSPECTIVE. BEFORE THE HELICOPTER A TANK, BEFORE THE TANK A HORSE, BEFORE THE HORSE A CHARIOT.
Army Command and General Staff Coll Fort Leavenworth Kans
Richard C. Strudeman. 7 Jun 70, 29p

Descriptors: (*Airmobile operations, History), Reviews, Army research, Vietnam, Theses, History.
Identifiers: *Air cavalry, South Vietnam.

Contents: Chariots and horses; World War I; Between the two World Wars; World War II; Post-World War II and Korea; Sky cav to air cavalry troop; Air assault and air mobility.
AD-713 378 HC$3.00 MF$0.65

I PROMISE: MAGSAYSAY'S UNIQUE PSYOP 'DEFEATS' HUKS.
Master's thesis,
Army Command and General Staff Coll Fort Leavenworth Kans
Clarence G. Barrens. 1970, 124p

Descriptors: (*Insurgency, Philippines), (*National defense, Leadership), (*Psychological warfare, *Philippines), Communists, Guerrilla warfare, Public opinion, Attitudes, Counterinsurgency, Political science, Theses.
Identifiers: Psychological operations, Magsaysay Ramon, Hukbalahaps.

Ramon Magsaysay, former mechanic, soldier, military governor, congressman, Secretary of national defense, and President of the Philippines, was successful against the Hukbalahap insurgency when two Presidents before him had failed. The evidence of this study supports the hypothesis that this leader used a unique psychological operations plan, based mainly on promise, which resulted in the 'defeat' of the Hukbalahap. (Author)
AD-713 411 HC$3.00 MF$0.65

PROCEEDINGS OF THE ARMY SCIENCE CONFERENCE (1970), HELD AT UNITED STATES MILITARY ACADEMY, WEST POINT, N. Y. ON 16-19 JUNE 1970. VOLUME I. PRINCIPAL AUTHORS A THROUGH G.
Office of the Chief of Research and Development (Army) Washington D C
For primary bibliographic entry see Field 5B.
AD-713 500 HC$3.00 MF$0.65

ADVANCED COMPUTATIONAL ALGORITHMS FOR LARGE SCALE, THREE DIMENSIONAL, ARTILLERY SURVEY APPLICATIONS,
Army Engineer Topographic Labs Fort Belvoir Va
For primary bibliographic entry see Field 19E.
AD-713 525 HC$3.00 MF$0.65

TACTICAL IMPLICATIONS OF THE PHYSIOLOGICAL STRESS IMPOSED BY CHEMICAL PROTECTIVE CLOTHING SYSTEMS,
Army Research Inst of Environmental Medicine Natick Mass
For primary bibliographic entry see Field 6Q.
AD-713 530 HC$3.00 MF$0.65

PROCEEDINGS OF THE ARMY SCIENCE CONFERENCE (1970) HELD AT UNITED STATES MILITARY ACADEMY, WEST POINT, N. Y. ON 16-19 JUNE 1970. VOLUME II. PRINCIPAL AUTHORS H THROUGH L.
Office of the Chief of Research and Development (Army) Washington D C
For primary bibliographic entry see Field 5B.
AD-713 533 HC$3.00 MF$0.65

PROCEEDINGS OF THE ARMY SCIENCE CONFERENCE (1970), HELD AT UNITED STATES MILITARY ACADEMY, WEST POINT, N. Y. ON 16-19 JUNE 1970. VOLUME III. PRINCIPAL AUTHORS M THROUGH Z.
Office of the Chief of Research and Development (Army) Washington D C
For primary bibliographic entry see Field 5B.
AD-713 561 HC$3.00 MF$0.65

TACTICS IN THE DEVELOPMENT OF MINE DETECTOR DOGS,
Army Land Warfare Lab Aberdeen Proving Ground Md
For primary bibliographic entry see Field 6C.
AD-713 577 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: HAND GRENADES.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 19F.
AD-713 754 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGE, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: DEMOLITIONS AND BOOBYTRAPS.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 19A.
AD-713 755 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: GRENADE LAUNCHER, 40MM, M79.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 19F.
AD-713 756 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS OF THE INFANTRY RIFLE SQUAD LEADER: PHYSICAL CONDITIONING.
Research By-Product,
George Washington Univ Alexandria Va Human Resources Research Office
Henry E. Kelly, and Arthur J. DeLuca. Dec 68, 12p
Contract DA-44-188-ARO-2

Descriptors: (*Physical fitness, Army training), (*Combat surveillance, Army training), (*Infantry, Leadership), Military requirements, Performance (Human), Warfare, Instruction manuals.
Identifiers: *Infantry rifle squad leaders.

The paper sets forth performances, knowledges, and skills necessary for the Infantry rifle squad leader to physically condition himself and his men to perform the missions of a rifle squad. (Author)
AD-713 757 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: OBSERVATION, COMBAT INTELLIGENCE AND REPORTING.
Research By-Product,
George Washington Univ Alexandria Va Human Resources Research Office
Frank L. Brown. Dec 68, 38p
Contract DA-44-188-ARO-2

Descriptors: (*Military intelligence, Army training), (*Combat surveillance, Army training), (*Infantry, Leadership), Performance (Human), Military tactics, Warfare, Instruction manuals, Electrooptics.
Identifiers: *Infantry fire team leaders, *Infantry rifle squad leaders, Night vision devices.

The paper is concerned with the technical and tactical proficiency required of the Infantry rifle squad leader to detect, locate, identify, and designate hostile targets suitable for engagement weapons; the collection, evaluation, interpretation and dissemination to his own men, and reporting to higher units of all available military information pertinent to the enemy, weather, terrain, and indigenous population as these elements are likely to affect military operations or pacification programs; and the supervision of squad members. (Author)
AD-713 758 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: HUMAN MAINTENANCE UNDER CAMPAIGN CONDITIONS.
Research By-Product,
George Washington Univ Alexandria Va Human Resources Research Office
Frank L. Brown, and T. O. Jacobs. Jan 69, 62p
Contract DA-44-188-ARO-2

Descriptors: (*Infantry, Personnel management), (*Combat surveillance, Army training), (*Leadership, Infantry), Nutrition, Hygiene, Military training, Warfare, Instruction manuals, Sleep, Motion sickness, Performance (Human).
Identifiers: *Infantry rifle squad leaders.

The paper covers the performances, knowledges, and skills demanded of the Infantry rifle squad leader to maintain an organized and effective fighting unit under campaign conditions and to set an example as a leader for his men. It covers personal hygiene and field santitation; the maintenance of minimal fighting and existence loads; water supply and consumption; combat feeding and nutrition; sleep requirements and the effects of sleep loss; prevention of malaria; prevention and treatment of motion sickness; prevention and recognition of combat exhaustion; and maintenance of vigilance under fatigue and stress. (Author)
AD-713 759 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: ANTITANK WEAPON, 66-MM HEAT ROCKET, M72.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 19G.
AD-713 789 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: MAINTENANCE OF CLOTHING AND EQUIPMENT.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 15E.
AD-713 790 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: DEFENSIVE OPERATIONS.
Research By-Product,
George Washington Univ Alexandria Va Human Resources Research Office
Frank L. Brown, and George J. Magner. Jun 69, 99p
Contracts DA-44-188-ARO-2, DAHC19-69-C-0018

Descriptors: (*Army operations, Army training), (*Combat surveillance, Army training), (*Infantry, Leadership), Tactical warfare, Performance (Human), Instruction manuals.
Identifiers: *Infantry rifle platoon leaders, *Infantry fire team leaders.

This paper sets forth the performances, knowledges, and skills required of the Infantry rifle platoon leader and his Infantry fire team leader to accomplish the mission of the rifle squad in defense and to adhere to the fundamentals of defense; to know and use standard terms and to apply logical troop-leading procedures when directing and supervising the rifle squad during defensive operations. (Author)
AD-713 791 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: COVER, CONCEALMENT, AND CAMOUFLAGE.
Research By-Product,
George Washington Univ Alexandria Va Human Resources Research Office
Frank L. Brown. Dec 68, 38p
Contract DA-44-188-ARO-2

Descriptors: (*Camouflage, Army training), (*Combat surveillance, Army training), (*Infantry, Leadership), Warfare, Instruction manuals, Performance (Human), Electrooptics.
Identifiers: *Infantry rifle squad leaders, Image intensification devices.

The paper deals with recognition and use of natural and man-made objects for protection against bullets, fragments, and blast, including nuclear fire and CBR agents; with concealment against enemy ground and aerial observation through use of natural and artificial camouflage, including the camouflage of exposed skin surfaces; and with the maintenance of light, noise, and odor discipline. Use of stealthy movement techniques; reaction to enemy flares or other illumination; action against enemy ground radar, infrared illumination, and image-intensification devices; and the use of weather and battle noises to cover movement are included. (Author)
AD-713 792 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: RIFLE, 7.62-MM, M14A1.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 19F.
AD-713 793 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: VISUAL, SOUND, AND TACTUAL COMMUNICATION.
Research By-Product,
George Washington Univ Alexandria Va Human Resources Research Office
Frank L. Brown. Dec 68, 12p
Contract DA-44-188-ARO-2

Descriptors: (*Signals, Army training), (*Combat surveillance, Army training), (*Infantry, Leadership), Performance (Human), Warfare, Instruction manuals.
Identifiers: *Infantry rifle squad leaders.

The paper describes the knowledges, skills, and performances required of the Infantry rifle squad leader to control men and fires in combat with visual, sound, and tactual means of communications. Use of standard arm-and-hand, flag, and panel signals, initiation of and response to prearranged and SOP sound signals, use of pyrotechnic signals, and the use of tactual communication techniques are covered. (Author)
AD-713 799 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: MISSION, ORGANIZATION, AND GENERAL OPERATION OF THE RIFLE SQUAD AND PLATOON.
Research By-Product,
George Washington Univ Alexandria Va Human Resources Research Office
Frank L. Brown, and Henry E. Kelly. 7 Jan 69, 29p
Contract DA-44-188-ARO-2

Descriptors: (*Army operations, Army training), (*Combat surveillance, Army training), (*Infantry, Leadership), Performance (Human), Warfare, Instruction manuals, Military intelligence.
Identifiers: *Infantry rifle squad leaders.

The paper covers the squad and platoon mission, organization, and major duties of squad and platoon members; troop-leading procedure; estimate of the situation; operation order; fundamentals of employment; effects of nuclear weapons; tactical operations in nuclear warfare; chemical and biological operations; action against enemy aircraft; use of assembly areas; intelligence; communication; fire support available from higher echelons; and the critique of combat operations. (Author)
AD-713 800 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: PORTABLE FLAMETHROWERS.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 19A.
AD-713 801 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: MESSENGER COMMUNICATION.
Research By-Product,
George Washington Univ Alexandria Va Human Resources Research Office
Frank L. Brown. Dec 68, 8p
Contract DA-44-188-ARO-2

Descriptors: (*Communication systems, Army training), (*Combat surveillance, Army training), (*Infantry, Leadership), Performance (Human), Warfare, Instruction manuals.
Identifiers: *Infantry rifle squad leaders, *Messenger service.

The paper lists the knowledges, skills, and performances required of the Infantry rifle squad leader to write messages and to instruct and supervise the performance of messengers. Procedures for delivery of written and oral messages, messenger briefing, destruction of messages when capture appears imminent, are covered. (Author)
AD-713 802 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: PROTECTION AGAINST CBR WARFARE AND NUCLEAR EXPLOSIONS.
Research By-Product,
George Washington Univ Alexandria Va Human Resources Research Office
Henry E. Kelly, and George J. Magner. Dec 68, 31p
Contract DA-44-188-ARO-2

Descriptors: (*Chemical warfare, Army training), (*Nuclear warfare, Army training), (*Combat surveillance, Army training), (*Infantry, Leadership), Personnel management, Hazards, Decontamination, Instruction manuals, Chemical warfare agents, Performance (Human).
Identifiers: *Infantry rifle squad leaders.

The paper covers the performances required of the Infantry rifle squad leader to detect, recognize, and report the employment of CBR and nuclear attacks and to supervise the activities of his men when faced with such hazards. (Author)
AD-713 803 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER. SELF-AID, FIRST AID AND EVACUATION.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 6E.
AD-713 805 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: RETROGADE OPERATIONS.
Research By-Product,
George Washington Univ Alexandria Va Human Resources Research Office
Fred K. Cleary. 7 May 69, 27p
Contracts DA-44-188-ARO-2, DAHC19-69-C-0018

Descriptors: (*Army operations, Army training), (*Combat surveillance, Army training), (*Infantry, Leadership), Performance (Human), Warfare, Instruction manuals.
Identifiers: *Infantry rifle squad leaders.

The paper covers the performances, knowledges, and skills required of the Infantry rifle squad leader to plan, prepare for, direct, and supervise his squad in any of the roles in which his parent platoon may be employed. (Author)
AD-713 806 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: AIRMOBILE OPERATIONS.
Research By-Product,
Human Resources Research Organization Alexandria Va
Frank L. Brown, Chester I. Christie, Jr., and Albert R. Amos, Jr. Dec 69, 57p
Contract DAHC19-70-C-0012

Descriptors: (*Airmobile operations, Army training), (*Combat surveillance, Army training), (*Infantry, Leadership), Warfare, Instruction manuals, Performance (Human).
Identifiers: *Infantry rifle squad leaders.

The paper describes the performances, knowledges, and skills required of the Infantry rifle squad leader to plan, coordinate, and execute airmobile operations when his squad is operating as an integral part of his platoon and when operating as a separate, reinforced unit directly under company or higher control. (Author)
AD-713 807 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: ANTI-PERSONNEL MINE M18A1 (CLAYMORE).
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 19F.
AD-713 808 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: ARMORED PERSONNEL CARRIER.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 19C.
AD-713 809 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: EMPLACEMENTS, SHELTERS, OBSTACLES, AND FIELDS OF FIRE.
Research By-Product,
George Washington Univ Alexandria Va Human Resources Research Office
Fred K. Cleary. 2 Feb 69, 22p
Contract DA-44-188-ARO-2

Descriptors: (*Army operations, Army training), (*Combat surveillance, Army operations), (*Infantry, Leadership), Shelters, Revetments, Construction, Performance (Human), Warfare, Instruction manuals.
Identifiers: *Infantry rifle squad leaders, *Barbed wire entanglements.

The paper covers the performances, knowledges, and skills required of the Infantry rifle squad leader to plan, direct, and supervise the construction of individual hasty emplacements, open and covered foxholes, emplacements for attached crew-served weapons, fighting trenches, hasty shelters, barbed wire entanglements and other passive obstacles; and the clearing of fields of fire. (Author)
AD-713 810 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: MACHINEGUN, 7.62-MM, M60.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 19F.
AD-713 811 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: MINES, ANTITANK AND ANTIPERSONNEL, AND WARNING AND ILLUMINATING DEVICES.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 19A.
AD-713 812 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: MOUNTED AND DISMOUNTED PLATOON COMBAT FORMATIONS.
Research By-Product.
George Washington Univ Alexandria Va Human Resources Research Office
Frank L. Brown, T. O. Jacobs, and Arthur J. DeLuca. 28 Jan 69, 48p
Contract DA-44-188-ARO-2

Descriptors: (*Army operations, Army training), (*Combat surveillance, Army training), (*Infantry, Leadership), Performance (Human), Warfare, Instruction manuals.
Identifiers: *Infantry rifle squad leaders.

The paper covers the standard mounted and dismounted platoon combat formations, including integrated infantry-tank formations, that must be employed to control the platoon's men and fires in combat. (Author)
AD-713 813 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: PATROLLING.
Research By-Product,
George Washington Univ Alexandria Va Human Resources Research Office
Fred K. Cleary. Jul 69, 64p
Contracts DA-44-188-ARO-2, DAHC19-69-C-0018

Descriptors: (*Army operations, Army training), (*Combat surveillance, Army training), (*Infantry, Leadership), Performance (Human), Warfare, Instruction manuals.
Identifiers: *Infantry rifle squad leaders, Patrolling.

The paper covers the performances, knowledges, and skills necessary for the Infantry rifle squad leader to employ his squad effectively in the conduct of patrolling operations under all conditions of weather, terrain, and visibility in both counterguerrilla and non-counterguerrilla operations. (Author)
AD-713 814 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: PROTECTION AGAINST MINES, BOOBYTRAPS, AND WARNING AND ILLUMINATING DEVICES.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 19A.
AD-713 815 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: RADIO COMMUNICATION.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 17B.
AD-713 816 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: RIFLE, 5.56MM, M16.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 19F.
AD-713 821 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: SQUAD FORMATIONS, BATTLE DRILL, AND ELEMENTARY FIRE AND MANEUVER.
Research By-Product,
George Washington Univ Alexandria Va Human Resources Research Office
Fred K. Cleary, Herbert Thompson, Arthur J. DeLuca, and George J. Magner. Mar 69, 18p
Contract DA-44-188-ARO-2

Descriptors: (*Army operations, Army training), (*Combat surveillance, Army training), (*Infantry, Leadership), Performance (Human), Warfare, Instruction manuals.
Identifiers: *Infantry rifle squad leaders.

The paper covers standard squad combat formations, the use of fire and maneuver/fire and movement, and the use of standard and nonstandard battle drill. (Author)

AD-713 822 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADERS: TACTICAL MOVEMENT.
Research By-Product,
Human Resources Research Organization Alexandria Va
Henry E. Kelly, and Fred K. Cleary. Dec 69, 20p
Contract DAHC19-70-C-0012

Descriptors: (*Tactical warfare, Army training), (*Combat surveillance, Army training), (*Infantry, Leadership), Performance (Human), Night warfare, Instruction manuals.
Identifiers: *Infantry rifle squad leaders.

The paper covers the combat performances, knowledges, and skills critical to the Infantry rifle squad leader in planning and directing his squad's actions when assigned security missions as part of a rifle platoon conducting or participating in tactical movement. Coverage includes the security and control measures common to both day and night movement and those applicable specifically to night movement. (Author)
AD-713 823 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: TECHNIQUE OF FIRE OF THE RIFLE SQUAD.
Human Resources Research Organization Alexandria Va
For primary bibliographic entry see Field 19F.
AD-713 824 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: OFFENSIVE OPERATIONS.
Research By-Product,
George Washington Univ Alexandria Va Human Resources Research Office
Fred K. Cleary, and Henry E. Kelly. 26 May 69, 41p
Contracts DA-44-188-ARO-2, DAHC19-69-C-0018

Descriptors: (*Army operations, Army training), (*Combat surveillance, Army training), (*Infantry, Leadership), Warfare, Performance (Human), Instruction manuals.
Identifiers: *Infantry rifle squad leaders.

The paper is concerned with the performances, knowledges, and skills required of the Infantry rifle squad leader in planning and directing his squad's actions as part of the platoon in company offensive operations. (Author)
AD-713 827 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: WIRE COMMUNICATION.
George Washington Univ Alexandria Va Human Resources Research Office
For primary bibliographic entry see Field 17B.
AD-713 828 HC$3.00 MF$0.65

16. MISSILE TECHNOLOGY

16B. Missile Trajectories

THE CHARACTERISTIC COEFFICIENTS TECHNIQUE FOR PROBABILITY MODELS OF WIND PROFILES IN MISSILE DESIGN AND ENVIRONMENT ANALYSIS,
Army Missile Command Redstone Arsenal Ala Physical Sciences Lab
For primary bibliographic entry see Field 4B.
AD-713 522 HC$3.00 MF$0.65

16D. Missiles

SIMULATION OF HIGH ALTITUDE IONIZED AIR WITH AN ARTIFICIAL DIELECTRIC,
Army Mobility Equipment Research and Development Center Fort Belvoir Va Electromagnetic Effects Lab
For primary bibliographic entry see Field 20N.
AD-713 531 HC$3.00 MF$0.65

17. NAVIGATION, DETECTION, COMMUNICATIONS, AND COUNTERMEASURES

17A. Acoustic Detection

AN EXPERIMENTAL MODEL STUDY OF UNDERWATER ACOUSTIC SCATTERING FROM A WIND-DRIVEN SURFACE.
Naval Underwater Systems Center New London Conn New London Lab
For primary bibliographic entry see Field 20A.
AD-713 068 HC$3.00 MF$0.65

SONOBUOY LOCATION.
Master's thesis,
Naval Postgraduate School Monterey Calif
Thomas Penn French, Jr. Sep 70, 77p

Descriptors: (*Radio sono buoys, Position finding), (*Antisubmarine aircraft, Range finding), Antisubmarine warfare, Hydrophones, Radiofrequency, Radio homing, Errors, Ground speed, Mathematical models, Computer programs, Theses.
Identifiers: Slant range.

In airborne anti-submarine warfare operations there is a critical requirement for maintaining an accurate relative plot of the sonobuoys with respect to the aircraft. This study proposed a method for locating sonobuoys in a pattern using aircraft-to-buoy slant range information. The method did not use triangulation procedures and attempted to minimize the restrictions placed on the aircraft. The study showed the feasibility of the proposed methodology and the approximate errors to be encountered. (Author)
AD-713 077 HC$3.00 MF$0.65

STUDY OF SOUND SCATTERING IN THE OCEAN.
Engineering rept. on phase 2, Jan-Aug 70,
Westinghouse Ocean Research Lab San Diego Calif
Gil A. Bank, William D. Clarke, Allen G. Haury, Al Kirst, Jr., and William P. Mullenhoff. Aug 70, 80p Rept no. 70-9S10-OCEAN-R1
Contract N00014-68-C-0366

Descriptors: (*Sonar equipment, Design), (*Underwater sound, Scattering), Sonar arrays, Sonar projectors, Depth indicators, Temperature, Transducers, Sonar receivers, Very low frequency, Diagrams, Display systems, Data processing systems, Performance (Engineering).

The design, assembly and at sea testing of a six-frequency sonar array system are described. The system, being a new one, had some technical problems most of which were resolved during sea testing. Useful acoustic data were acquired with the sonar array system during the initial three week work period at sea and these data are partially analyzed. (Author)
AD-713 238 HC$3.00 MF$0.65

GENERAL TREATMENT OF MODULATION SCANNING,
Admiralty Research Lab Teddington (England)
G. M. Voglis. Feb 70, 50p Rept no. ARL/H/R3
NSTIC-27406

Descriptors: (*Scanning sonar, Performance (Engineering)), Sonar signals, Sound transmission, Phase shifters, Matrix algebra, Modulation, Great Britain.
Identifiers: *Modulation scanning.

The basic principles of scanning sonars employing modulation scanning are described. Using elementary matrix theory a number of methods involving frequency change are evolved including a multistage system of particular relevance to rapid scanning of fine beams over wide sectors. Phasing requirements and limitations due to carrier frequency are examined. (Author)
AD-713 278 HC$3.00 MF$0.65

THE EFFECT OF FALSE CONTACTS ON THE PROBABILITY OF DETECTING A SUBMARINE.
Naval Postgraduate School Monterey Calif
For primary bibliographic entry see Field 15A.
AD-713 394 HC$3.00 MF$0.65

SOME INFORMATION PROCESSES FOR ARRAYS OF SENSORS.
Interim rept.,
Naval Research Lab Washington D C
David Swick, F. Mansfield Young, and William Finney. 1 Oct 70, 50p Rept no. NRL-7181

Descriptors: (*Acoustic detectors, Data processing systems), (*Sound signals, Mathematical analysis), Integral transforms, Partial differential equations, Matrix algebra, Statistical tests, Wave functions, Sampling, Programming (Computers).
Identifiers: *Acoustic arrays, Fourier transformation.

Representing an energy field over an interval of time by a single, multidimensional array of data permits formulations of the sensor-array problem that are well suited to use of known mathematical techniques on existing mathematical machines. One considers some resulting transformations and analysis procedures that can provide operationally useful information from operational acoustic arrays. In particular the report discusses multidimensional generalized transforms that map arrays of data into arrays of coefficients of basis functions and formal analysis procedures that operate on the arrays of coefficients to provide estimates of desired field or source parameters. The data arrays may result from nonuniformly spaced sample points in space and time. The basis functions are exemplified by exponentials in wavenumber-frequency space, and for that case analysis-of-variance techniques may be applied to the array of coefficients to provide estimates of the spatial and temporal frequency components of the field. (Author)
AD-713 456 HC$3.00 MF$0.65

OPTIMUM THEORETICAL STRUCTURES OF SONAR SYSTEMS EMPLOYING SPATIALLY-DISTRIBUTED RECEIVING ELEMENTS.
Saclant ASW Research Center, La Spezia (Italy).
F. Bryn. 1 Sep 68, 50p SACLANTCEN-TR-119
Conf- Presented At the Nato Advan. Study Inst. on Signal Process., Enschede, Neth., 12 - 23 Aug. 1968

Descriptors: *Adaptive filters, *Antisubmarine warfare, *Random noise, *Sonar, Background noise, Signal processing, Spatial distribution, Target acquisition.

For abstract, see STAR 08 21.
N70-38736 HC$3.00 MF$0.65

17B. Communication

DESIGN OF AN OPTIMUM NAVY ENLISTED CLASSIFICATION STRUCTURE. ANALYSIS OF THE REQUIREMENT FOR THE COMMU-

NICATIONS YEOMAN (CYN) SERVICE RATING.
Naval Personnel Research and Development Lab Washington D C
For primary bibliographic entry see Field 5I.
AD-713 089 HC$3.00 MF$0.65

TRAINING FEEDBACK ON THE AN/SRC-20, 21 RADIO SETS.
Naval Personnel and Training Research Lab San Diego Calif
For primary bibliographic entry see Field 5I.
AD-713 090 HC$3.00 MF$0.65

A RADIO-METEOROLOGICAL INVESTIGATION OF FADING AT 2 GHz IN THE MEKONG DELTA.
Technical memo.,
Institute for Telecommunication Sciences Boulder Colo
C. F. Peterson, L. J. Maloney, and C. A. Samson.
Sep 70, 84p Rept no. ITS-248

Descriptors: (*Radio transmission, Attenuation), (*Meteorological parameters, *Vietnam), Radio waves, Refractive index, Radiosondes, Airborne, Atmospheric sounding, Very low frequency, Signal-to-noise ratio, Radio equipment, Performance (Engineering), Tropical regions.
Identifiers: Mekong Delta, South Vietnam, Monsoons.

Intensive radio and meteorological measurements were conducted on two links of the Integrated Communication System in the Mekong Delta of South Viet Nam during January, February, and March 1970. This study investigated the possible causes of severe fading on these beyond-the-horizon links, with the objective of determining corrective action for existing paths in the Delta and improved design considerations for future systems. Measurement results indicated that subrefractive conditions were substantially more prevalent than had been expected on the basis of meteorological data obtained from Saigon. (Author)
AD-713 128 HC$3.00 MF$0.65

AN EXPANDED CHARACTERIZATION OF THE INFORMATION CAPACITY OF A SHORT RANGE UNDERWATER COMMUNICATIONS CHANNEL.
Master's thesis,
George Washington Univ Washington D C School of Engineering and Applied Science
Robert Lee Kelley. 26 Aug 70, 122p
Contract N00014-67-A-0214-0003

Descriptors: (*Underwater communication systems, *Information theory), (*Sound transmission, Underwater sound), Transducers, Transmitter-receivers, White noise, Gain, Attenuation, Detection, Integral equations, Statistical functions, Transfer functions, Power spectra, Probability, Distribution functions, Theses.
Identifiers: Gaussian noise, Filtering theory, *Information capacity.

The report considers theoretical limits in transmitting information through an underwater communications channel. Acoustic energy is the vehicle for information transfer since virtually no other form of energy propagates usefully in sea water. Short range near surface transmissions between computer bearing ocean vessels in the mid North Atlantic are evaluated. The characterization conducted provides valuable guidance needed for designing optimum signal generation and detection systems. The fundamental mechanism involved in undersea transmissions is analyzed to develop a channel model. Major channel characteristics are high energy absorption and the severe time varying multipath environment. It is shown that directive transmitting and receiving transducers mitigate the multipath problems and allow a frequency dispersive, time selective model to be employed. (Author)
AD-713 146 HC$3.00 MF$0.65

TAETIGKEITSBERICHTE 1969. FACHGEBIET 5: ELEKTRONIK (Activity Report 1969. Division 5. Electronics),
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Porz-Wahn (West Germany)
For primary bibliographic entry see Field 9C.
AD-713 211

IONOSPHERIC DATA REPORT - MAY 1970.
Military Research and Development Center Bangkok (Thailand)
For primary bibliographic entry see Field 20N.
AD-713 247 HC$3.00 MF$0.65

100-LINE QUASI-ELECTRONIC AUTOMATIC TELEPHONE EXCHANGE,
Signals Research and Development Establishment Christchurch (England)
P. Heaton, and E. F. Stallard. Jun 70, 97p* Rept no. SRDE-70025 TRC-BR-21007

Descriptors: (*Telephone equipment, Automatic), Switching circuits, Logic circuits, Integrated circuits, Design, Great Britain.
Identifiers: *Telephone exchanges.

The paper describes the design, operation and construction of an experimental 100-line quasi-electronic automatic telephone exhange employing a diaphragm relay matrix and integrated logic circuits. (Author)
AD-713 256 HC$3.00 MF$0.65

DETERMINATION OF THE ATTENUATION OF OPTICAL GLASS FIBRES,
Signals Research and Development Establishment Christchurch (England)
For primary bibliographic entry see Field 20F.
AD-713 262 HC$3.00 MF$0.65

A DUAL OUTPUT 1.6 GHz SOLID-STATE POWER SOURCE.
Royal Aircraft Establishment Farnborough (England)
For primary bibliographic entry see Field 9E.
AD-713 292 HC$3.00 MF$0.65

IONOSPHERIC DATA REPORT - JUNE 1970.
Military Research and Development Center Bangkok (Thailand)
For primary bibliographic entry see Field 20N.
AD-713 490 HC$3.00 MF$0.65

DIE ANTENNENANLAGEN DER ZENTRALEN DEUTSCHEN BODENSTATION (ZDBS) FUER SATELLITENFUNK (Antenna Installations of the Central German Ground Station for Satellite Communications),
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Oberpfaffenhofen (West Germany)
For primary bibliographic entry see Field 9E.
AD-713 640

A NEW SATELLITE MULTIPLE ACCESS TECHNIQUE.
Technical rept.,
Rome Air Development Center Griffiss AFB N Y
John J. Patti. Sep 70, 159p Rept no. RADC-TR-70-167
Master's thesis.

Descriptors: (*Communication satellites (Passive), Radio signals), (*Radio transmission, Signal-to-noise ratio), Transmitter-receivers, Statistical analysis, Monte Carlo method, Transformations (Mathematics), Vector analysis, Power spectra, Spectrum analyzers, Phase shift, Frequency modulation, Computer programs, Integral transforms, Integration.
Identifiers: Computerized simulation, Chi square test.

The Second Order Coherent Multiple Access (SOCMA) technique is proposed to satisfy the simultaneous demands of a large group of communications satellite users. The three basic satellite multiple access techniques, time, frequency, and code division techniques, are briefly reviewed. The performance of SOCMA is evaluated and compared to that of the three basic techniques. The analysis uses random waveform computer simulation to investigate the SOCMA performance. The goodness of the random waveform simulation, in terms of simulation precision, is evaluated by application of the Chi-Square test. For this evaluation, a Quadratic/Gradient optimization algorithm is formulated which approximates the Chi-square surface in a local neighborhood of the mean and standard deviation by a parabolic surface. Utilizing this algorithm, a minimum Chi-square is found which yields the best fit of the normal distribution to the sample histogram distribution. (Author)
AD-713 674 HC$3.00 MF$0.65

SPEECH SPECTROGRAMS USING THE FAST FOURIER TRANSFORM,
Massachusetts Inst of Tech Cambridge
Alan V. Oppenheim. Aug 70, 6p
Contract F19628-69-C-0044
Availability: Pub. in IEEE Spectrum, v7 n8 p57-62 Aug 70.

Descriptors: (*Speech recognition, Spectrum analyzers), Resonant frequency, Narrowband, Broadband, Algorithms.
Identifiers: Fast fourier transform, Spectrum analysis, Spectrograms.

An important aid in the analysis and display of speech is the sound spectrogram, which represents a time--frequency--intensity display of the short-time spectrum. With many modern speech facilities centering around small or medium-size computers, it is often useful to generate spectrograms digitally, on-line. The fast Fourier transform algorithm provides a mechanism for implementing this efficiently. (Author)
AD-713 751

CLASSIFICATION OF SPEECH SOUND BASED ON RECOGNITION AT HIGH RATE OF REPETITION (Klassifikatsiya Zvukov Rechi pri ikh Bystrom Povtorenii),
Army Foreign Science and Technology Center Washington D C
L. A. Chistovich. 12 Jun 70, 15p Rept no. FSTC-HT-23-722-70
Trans. of Akusticheskii Zhurnal (USSR) v6 n3 p392-398 1960.

Descriptors: (*Speech recognition, Classification), Speech, Phonetics, USSR.
Identifiers: Translations.

Recognition of sounds created by rapid repetition, imitation, and phoneme discrimination of vowels is investigated. It is shown that the distinctness (with respect to phoneme classification) of sounds created by rapid repetition is dependent on the distinctness of initial sounds. Indistinct initial sounds also produce indistinct sounds at the output. The same effect is observed in imitation. In the case of phoneme discrimination indistinct initial sounds produce completely distinct sounds at the output. It is concluded that rapid repetition of sounds is coincident with their imitation. A two-stage scheme is considered for speech discrimination, based on preliminary imitation, and then on phoneme classification of the types of motions used in imitation. (Author)
AD-713 763 HC$3.00 MF$0.65

THE PROGRAM INTERRUPTION ROUTINE FOR THE ELECTRONIC COMPUTER DNEPR 1.
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 9B.
AD-713 787 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: RADIO COMMUNICATION.
Research By-Product,
George Washington Univ Alexandria Va Human Resources Research Office
Frank L. Brown. Dec 68, 12p
Contract DA-44-188-ARO-2

Descriptors: (*Radio communication systems, Army training), (*Combat surveillance, Army training), (*Infantry, Leadership), Radio equipment, Antennas, Installation, Warfare, Instruction manuals, Performance (Human).
Identifiers: *Infantry rifle squad leaders.

Performances are cited outlining the technical proficiency required of the Infantry rifle squad leader to plan, coordinate, and supervise radio communication; to perform and supervise under maintenance; to site, operate, pack, and transport the radio sets and accessories. (Author)
AD-713 816 HC$3.00 MF$0.65

DETERMINATION OF ATMOSPHERICALLY INDUCED PHASE FLUCTUATIONS BY LONG-DISTANCE INTERFEROMETRY AT 6328 A,
Army Electronics Command Fort Monmouth N J Inst for Exploratory Research
For primary bibliographic entry see Field 20F.
AD-713 817

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: WIRE COMMUNICATION.
Research By-Product,
George Washington Univ Alexandria Va Human Resources Research Office
Frank L. Brown. Dec 68, 12p
Contract DA-44-188-ARO-2

Descriptors: (*Telephone communication systems, Army training), (*Combat surveillance, Army training), (*Infantry, Leadership), Installation, Performance (Human), Warfare, Instruction manuals.
Identifiers: Infantry rifle squad leaders.

The paper outlines the technical proficiency required of the Infantry rifle squad leader to plan and coordinate wire communication and to supervise installation, operation, safeguarding, maintenance, and recovery of wire communications equipment. (Author)
AD-713 828 HC$3.00 MF$0.65

THEORY OF GROUND-WAVE PROPAGATION ACROSS A ROUGH SEA AT DEKAMETER WAVELENGTHS.
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
For primary bibliographic entry see Field 20N.
AD-865 840 HC$3.00 MF$0.65

LASER COMMUNICATIONS TODAY AND TOMORROW,
Joint Publications Research Service, Washington, D.C.
R. Kazaryan, and V. Tatarnikov. 12 Oct 70, 8p
Trans. of Radio, Moscow (USSR) n8 p14-17 1970.

Descriptors: (*Lasers, *Optical communication), Feasibility, Performance, Gas lasers, Semiconductor lasers, Infrared lasers, Translations, USSR.

The report covers the feasibility of using lasers in optical communications systems, noting the performance of certain lasers to be used and the effect that weather might have on the transmission of signals.
JPRS-51546 HC$3.00 MF$0.65

EXPERIMENTAL RESEARCH AND MODELING OF REAL- TIME COMMUNICATION CHANNELS. FEEDBACK SYSTEMS.
Academy of Sciences (USSR), Moscow. Scientific Soviet on the Complex Problem of Cybernetics.
1969, 157P
Lang- in Russian Conf- Presented At the 4th Conf., Sect. 3, of the Sci. Soviet on the Complex Probl. of Cybernetics of Acad. Csi. USSR, the Cybernetics Inst. and Computer Center of Acad. Sci. Uzbek Ssr, the Inst. of Inform. Transmission Probl. of Acad. Sci. USSR, and the Sci. and Tech. Soc. of Radio Eng. and Telecommun., Conf. on the Theory of Inform. Transmission and Coding Held in Tashkent,

Descriptors: *Conferences, *Data transmission, *Feedback control, *Information theory, *Mathematical models, *Telecommunication, Algorithms, Digital data, Error detection codes, Pulse communication.

For abstract, see STAR 08 21.
N70-38407 HC$3.00 MF$0.65

GENERALIZED SCHEMATIC FOR DATA TRANSMISSION WITH FEEDBACK.
Academy of Sciences (USSR), Moscow. Scientific Soviet on the Complex Problem of Cybernetics.
Z. M. Kanevskiy. 1969, 6p
Real-time Commun. Channels. Feedback Systems 1969 P 88-93 (See N70-38407 21-07) Lang- in Russian

Descriptors: *Data transmission, *Error analysis, *Feedback, *Probability theory, Circuit reliability, Communication theory, Conferences, Error functions, Signal distortion.

For abstract, see STAR 08 21.
N70-38422 HC$3.00 MF$0.65

DEVELOPMENT OF A GRIDDED POWER TUBE FOR SPACE APPLICATION.
Entwicklung Einer Gittergesteuerten Senderoehre Fuer Raumfluganwendung
Siemens A.G., Munich (West Germany).
W. Schneider. Apr 70, 36p BMBW-FB-W-70-25
Lang- in German, English Summary Spon- Sponsored By Bundesmin. Fuer Bildung Und Wiss.

Descriptors: *Radio transmitters, *Space communication, *Triodes, *Tube cathodes, Capillary tubes, Ceramic coatings, Osmium, Planar structures, Service life, Temperature effects, Tube grids.

For abstract, see STAR 08 21.
N70-38485 HC$3.00 MF$0.65

POWER RATIO OF WANTED TO UNWANTED SIGNALS FOR FREQUENCY SHARING BETWEEN FM AND AM-VSB TELEVISION TRANSMISSION SYSTEMS.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
E. F. Miller, and R. W. Myhre. Sep 70, 41p NASA-TM-X-2080, E-5627
Contract 164-21

Descriptors: *Amplitude modulation, *Frequency modulation, *Radio frequency interference, *Sidebands, *Television transmission, Ground stations, Mathematical models, Satellite television.

For abstract, see STAR 08 21.
N70-38797 HC$3.00 MF$0.65

PULSE CODE MODULATION OF VIDEO SIGNALS - 8-BIT CODER AND DECODER.
British Broadcasting Corp., Kingswood (England). Research Dept.
1970, 13P REPT-1970/25

Descriptors: *Analog to digital converters, *Pulse code modulation, *Television transmission, *Video data, Coders, Decoders, Integrated circuits, Signal to noise ratios, Time signals.

For abstract, see STAR 08 21.
N70-38849 HC$3.00

POST-CRASH COMMUNICATIONS.
AIL, Deer Park, N.Y.
For primary bibliographic entry see Field 13L.
PB-194 974 HC$3.00 MF$0.65

17D. Electromagnetic and Acoustic Countermeasures

SIMULATION OF HIGH ALTITUDE IONIZED AIR WITH AN ARTIFICIAL DIELECTRIC,
Army Mobility Equipment Research and Development Center Fort Belvoir Va Electromagnetic Effects Lab
For primary bibliographic entry see Field 20N.
AD-713 531 HC$3.00 MF$0.65

17E. Infrared and Ultraviolet Detection

INFRARED DETECTORS, LASER TECHNOLOGY AND SIGNAL PROCESSING.
Minnesota Univ Minneapolis Dept of Electrical Engineering
For primary bibliographic entry see Field 20E.
AD-713 223 HC$3.00 MF$0.65

NEODYMIUM YAG LASER FOR OPTICAL RADAR APPLICATIONS,
Army Electronics Command Fort Monmouth N J Electronic Components Lab
John W. Strozyk, and Vincent J. Rosati. 1970, 14p

Descriptors: (*Opdar, Systems engineering), (*Lasers, Performance (Engineering)), Doping, Neodymium, Yttrium compounds, Aluminates, Test methods, Feasibility studies.
Identifiers: *YAG Lasers, Yttrium aluminum garnets, Yttrium aluminates.

The development of the Nd:YAG laser resulted in a relatively simple Nd:YAG device with characteristics worthly of optical radar feasibility studies over short ranges, the results of which are presented here. The requirements includes the Nd:YAG laser as the transmitter, telescope optics for beam collimation, telescope optics to collect returning signals, a photomultiplier to process the signals and an oscilloscope to display the information. The design of each unit or component will be fixed by the laser characteristics and to some extent by the intended application (i.e. simple range data as compared to range rate data). The analysis or design of any radar system inevitably involves a radar range equation in one form or other. This approach is applicable to laser radars and has been used by many people under the assumption of having diffuse targets and constant atmospheric parameters. The results, whicl only approximations, are of acknowledged use and are developed here. (Author)
AD-713 582 HC$3.00 MF$0.65

ULTRAVIOLET ABSORPTION AND LUMINESCENCE INVESTIGATIONS.
Geological Survey, Washington, D. C.
For primary bibliographic entry see Field 8G.
For abstract, see STAR 08 21.
N70-38944 HC$3.00 MF$0.65

GEOLOGICAL STUDIES OF THE EARTH AND PLANETARY SURFACES OF ULTRAVIOLET ABSORPTION AND SIMULATED LUMINESCENCE.
Geological Survey, Washington, D. C.
For primary bibliographic entry see Field 8G.
For abstract, see STAR 08 21.
N70-38945 HC$3.00 MF$0.65

17F. Magnetic Detection

PRELIMINARY RESULTS OF AERIAL INFRARED SURVEYS AT PISGAH CRATER, CALIFORNIA.
Geological Survey, Washington, D. C.
For primary bibliographic entry see Field 8F.
For abstract, see STAR 08 21.
N70-38898 HC$3.00 MF$0.65

17G. Navigation and Guidance

AIRCRAFT OPTIMUM MULTIPLE FLIGHT PATHS.
Final technical rept. May 69-May 70,
Honeywell Inc Minneapolis Minn Systems and Research Center
Robert L. Schultz, and Philip S. Kilpatrick. Jun 70, 132p Rept no. 12602-FR JANAIR-700709
Contract N00014-69-C-0339

Descriptors: (*Flight paths, Optimization), (*Air traffic control systems, Optimization), Army aircraft, Helicopters, Aircraft carriers.

The objectives of the study are to apply existing optimization techniques of modern control theory to compute aircraft trajectories and to define an approach to implement the results into an improved military air traffic management (ATM) system. The recommended concept provides positive control of the airspace by acquiring aircraft formations, determining aircraft positions, assigning landing priorities, calculating optimum trajectories subject to constraints, and transmitting steering commands to the aircraft. Although the concept is developed in terms of an aircraft carrier operational setting and the analysis concentrates on minimum fuel trajectories, the concept is generally applicable to military ATM problems such as Army helicopters or fixed wing aircraft in the vicinity of an airbase, and the analysis techniques are candidates for other aircraft optimization problems such as minimum time-to-climb or minimum time-to-descent trajectories. The purpose of this concept is to increase overall operational capability by increasing the overall range or time-over-target of aircraft, reducing the threat to aircraft carriers, and simplifying and automating ATC procedures for pilots and controllers. An analytical approach was developed in this study to reduce the complexity of the optimum trajectory calculation so that acceptable accuracy is achieved with minimal computer capacity. The optimum trajectories are computed by an iterative solution technique that converges rapidly to the final trajectory. (Author)
AD-713 136 HC$3.00 MF$0.65

EARTH ENVIRONMENTAL NOISE FIELDS.
Air Force surveys in geophysics,
Air Force Cambridge Research Labs L G Hanscom Field Mass
F. A. Crowley, and H. A. Ossing. 19 Aug 70, 16p
Rept nos. AFCRL-70-0460, AFCRL-AFSIG-224

Descriptors: (*Inertial guidance, Performance (Engineering)), (*Environmental tests, Noise), Earth (Planet), Motion, Errors, Tests.

A new method to approach earth noise field problems in inertial component testing is presented. This method is considered superior to accepted 'quiet site' and 'motion suppression structure' techniques. The approach is to describe earth noise by determining: (1) the class of the random motion; (2) the level of motion; (3) the mode of motion; and (4) the component relationships. The efficacy and rationale of this technique is demonstrated in an experiment that results in the removal of earth noise error terms from gyro data. (Author)
AD-713 172 HC$3.00 MF$0.65

TAETIGKEITSBERICHTE 1969. FACHGEBIET 5: ELEKTRONIK (Activity Report 1969. Division 5. Electronics),
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Porz-Wahn (West Germany)
For primary bibliographic entry see Field 9C.
AD-713 211

AN ARMY FLIGHT FACILITIES INSPECTION BRANCH – THE QUALITY CONTROL ARM ESSENTIAL TO SAFETY IN AIR TRAFFIC CONTROL.
Individual research elective thesis,
Army Command and General Staff Coll Fort Leavenworth Kans
Glenn A. Leister. 1970, 34p

Descriptors: (*Air traffic, Army operations), (*Air traffic control systems, Quality control), Feasibility studies, Visual inspection, Air traffic controllers, Army training, Radar equipment, Safety, Installation, Errors, Artillery fire, Glide path systems, Vietnam, Theses.
Identifiers: Army flight inspection branch.

The document is concerned with important problems regarding air traffic controller training at many of the Army's flight facilities in CONUS and overseas. The organization of a group to supervise ATC operations in Vietnam emphasizes the importance of such problems. The Army has laid the groundwork to eliminate deficiencies in its ATC operations but needs an effective management tool. Recommendations are made. (Author)
AD-713 375 HC$3.00 MF$0.65

ALL-WEATHER, LOW-LEVEL NAVIGATION.
Semi-annual rept. no. 1, Oct 69-Apr 70.
Ohio Univ Athens Dept of Electrical Engineering

Sep 70, 33p ECOM-0084-1/SA
Contract DAAB07-68-C-0084
See also Annual rept. no. 1, AD-685 858.

Descriptors: (*All-weather aviation, Navigation computers), (*Navigation computers, Systems engineering), Position finding, Low altitude, Radio receivers, Frequency synthesizers, Display systems, Ground position indicators, Flight simulators, Special purpose computers.
Identifiers: Themis project, Kalman filters, Program management.

The multifaceted work associated with the early phases of the Ohio University Themis project has gradually been consolidated into the broad areas of receiver and computer technology as applied to producing the All-Weather, Low-Level Navigation System. The design and breadboarding of a tuned radio frequency (TRF) receiver has been completed. Results of laboratory tests of the TRF breadboard indicate the receiver is phase-stable to within one electrical degree; its design objective. Effort on the maximum likelihood estimator (MLE) has been divided into two efforts. First, verification of earlier theoretical investigation comparing phase-locked loop and MLE receiver structures was accomplished. Second, refinements in the physical realization of the MLE were achieved and a brassboard design frozen. The airborne reference frequency synthesizer has been designed and is being fabricated. In addition, precision stability measurements are being accomplished on a new crystal standard to ascertain its suitability for future airborne use. Work continues in the area of system integration and analysis, particularly in the application of Kalman filtering techniques for estimating position accurately and in the broad area of man-machine relationships required in the low-level, all-weather navigation system. (Author)
AD-713 420 HC$3.00 MF$0.65

DETERMINATION OF LATITUDE AND LONGITUDE OF UNKNOWN STATIONS FROM PHOTOGRAPHICS OF A SATELLITE AGAINST STELLAR BACKGROUND INDEPENDENT OF ANY DISTANCE,
Army Engineer Topographic Labs Fort Belvoir Va
For primary bibliographic entry see Field 17H.
AD-713 508 HC$3.00 MF$0.65

THE APPLICATION OF A SOLID STATE HELIUM-NEON GAS LASER TO MISSILE GUIDANCE,
Army Advanced Ballistic Missile Defense Agency Huntsville Ala
Wilber H. Gibson. 1970, 10p

Descriptors: (*Gyro stabilizers, Gas lasers), (*Gas lasers, *Inertial guidance), (*Guided missile components, Gas lasers), Stabilized platforms, Gimbals, Lasers, Alignment, Statistical analysis, Cost effectiveness, Design.
Identifiers: *Laser gyros, Helium neon lasers.

The paper describes the development of laser gyro systems and compares them with conventional gyro systems. The uses of the laser gyro system are given and the advantages of the system for future applications are outlined. (Author)
AD-713 527 HC$3.00 MF$0.65

THE DEVELOPMENT OF A KALMAN FILTERING ALGORITHM FOR HYBRID NAVIGATION IN ARMY AIRCRAFT,
Army Electronics Command Fort Monmouth N J
Joseph A. Knight. 1970, 14p

Descriptors: (*Navigational aids, Army aircraft), (*Control systems, Mathematical models), Analog-digital computers, Data processing systems, Matrix algebra, Navigation computers, Integrals, Integration, Algorithms, Errors.
Identifiers: Filtering theory, Kalman filters, Covariance matrix.

Control system solutions have been formulated using Kalman filtering -- a data processing technique whereby a dynamic error model of the system, as well as the statistical parameters of the instrumentation and measurement noise, are combined in a state space equation to estimate the system errors. Hybrid navigation is a natural candidate for such control techniques and several studies have been made in this general area although no systems designed for Army aircraft have been flown. This paper will present the analytical results obtained in the first phase of a US Army program to determine the feasibility of hybrid navigation for Army purposes. The program will culminate in flight tests in 1970-71. The paper will address four major areas: synoptic statement of Kalman filter principles, general determination of needs unique to the Army, error model analysis of the candidate navigation subsystem, and development of the Kalman filter algorithm. (Author)
AD-713 553 HC$3.00 MF$0.65

RECEIVER DESIGN FOR A SHORT RANGE, PRECISE, NAVIGATION SYSTEM.
Master's thesis,
Naval Postgraduate School, Monterey, Calif.
Norman Mattoon Thomas, III. Dec 67, 72p
Distribution Limitation now Removed.

Descriptors: (*Radio receivers, *Radio navigation), Design, Phase control, Phase locked systems, Voltage controlled oscillators, Feasibility, Theses, Continuous radiation.

A precise navigation system was proposed for use in mine and amphibious warfare. It is a continu-

ous-wave phase comparison system, which derives its information from the change in phase between two stable oscillators as the distance between them is varied. A receiver, with very good phase versus temperature stability, was designed for this system. A test circuit was designed to field monitor any receiver phase changes which do occur. A method to frequency lock several oscillators to a master was also devised. Tests were run to determine the stability of the receiver, and the feasibility of the system. (Author)
AD-828 259 HC$3.00 MF$0.65

THE USE OF STATISTICS IN GUIDANCE ANALYSIS.
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
D. H. Galli. 12 Sep 69, 35p NASA-TM-X-53903, MSFC-IN-68-2

Descriptors: *Normal density functions, *Perturbation theory, *Space navigation, *Statistical analysis, Injection guidance, Midcourse guidance, Position errors.

For abstract, see STAR 08 21.
N70-38167 HC$3.00 MF$0.65

SPACECRAFT STAR TRACKERS.
Kollsman Instrument Corp., Elmhurst, N. Y.
Jul 70, 69p NASA-SP-8026
Spon- Sponsored By Nasa

Descriptors: *Aerospace engineering, *Spacecraft guidance, *Star trackers, Electronic packaging, Optical equipment, Photometers, Signal to noise ratios, Systems analysis.

For abstract, see STAR 08 21.
N70-38721 HC$3.00 MF$0.65

17H. Optical Detection

A FEASIBILITY STUDY FOR A NONPHOTOGRAPHIC SATELLITE TRACKING SENSOR.
Final rept. Apr-Jul 70,
Bendix Corp Denver Colo Navigation and Control Div
Georg Rupprecht, and T. J. Stevens. 15 Oct 70, 119p Rept no. STS-115 AFCRL-70-0436
Contract F19628-70-C-0161

Descriptors: (*Satellite tracking systems, Electrooptics), Electronic equipment, Feasibility studies, Resolution, Detection, Photons, Cameras, Stars, Sensors, Data processing systems, Computer storage devices, Photographic plates, Image orthicons.
Identifiers: Television sensors, PC-1000 cameras.

It is shown that the photographic plate in satellite triangulation can be replaced by an electro-optical device without loss of accuracy. The higher sensitivity and the unique storage capability of the electro-optical scheme increases the number of available target satellites and the number of available stars for positioning. A scheme has been developed where the accurate positioning of the satellite is accomplished by the retrieval of two times from the record, independent of metric distortions. The data evaluation is completely computerized without necessity of human interference. (Author)
AD-713 162 HC$3.00 MF$0.65

EXPLORATORY DEVELOPMENT OF THE WSMR CINETHEODOLITE.
Final rept.,
White Sands Missile Range N Mex National Range Engineering
Lowell D. Yates. Jun 70, 219p Rept no. STEWS-RE-I-70-2

Descriptors: (*Phototheodolites, Design), Operation, Configuration, Mirrors, Illumination, Telescopes, Accuracy, Tests, Photographic recording systems, Guided missile ranges, New Mexico.
Identifiers: *Cine theodolites.

A breadboard instrument was developed for the purpose of establishing the feasibility of a novel and unique type of theodolite with far greater dynamic pointing accuracy than is possible with conventional theodolites. This report documents the results of the test and evaluation and the measurement techniques employed. The report discusses design deficiencies of the breadboard instrument along with recommended improvements for future development of an operational instrument. (Author)
AD-713 421 HC$3.00 MF$0.65

HUMAN PERFORMANCE EXPERIMENTATION IN NIGHT OPERATIONS: TECHNOLOGY AND INSTRUMENTATION FOR FIELD RESEARCH.
Army Behavior and Systems Research Lab Arlington Va
For primary bibliographic entry see Field 5E.
AD-713 463 HC$3.00 MF$0.65

DETERMINATION OF LATITUDE AND LONGITUDE OF UNKNOWN STATIONS FROM PHOTOGRAPHICS OF A SATELLITE AGAINST STELLAR BACKGROUND INDEPENDENT OF ANY DISTANCE,
Army Engineer Topographic Labs Fort Belvoir Va
Angel A. Baldini. 1970, 14p

Descriptors: (*Optical tracking, Navigational aids), Satellite tracking systems, Photointerpretation, Position finding, Least squares method.

The method is based on observations of an active or passive satellite, photographed against a stellar background, from a camera situated at an unknown station. The station position's coordinates are then fixed, geocentric latitude and longitude, independently of any distance. (Author)
AD-713 508 HC$3.00 MF$0.65

OPTIMIZATION ANALYSIS OF A COMPACT LIGHTWEIGHT LASER RANGEFINDER,
Frankford Arsenal Philadelphia Pa
For primary bibliographic entry see Field 20E.
AD-713 517 HC$3.00 MF$0.65

ADVANCED COMPUTATIONAL ALGORITHMS FOR LARGE SCALE, THREE DIMENSIONAL, ARTILLERY SURVEY APPLICATIONS,
Army Engineer Topographic Labs Fort Belvoir Va
For primary bibliographic entry see Field 19E.
AD-713 525 HC$3.00 MF$0.65

APPLICATION OF SENSING ARRAYS TO PHOTOGRAMMETRY AND METROLOGY,
Army Engineer Topographic Labs Fort Belvoir Va
For primary bibliographic entry see Field 8B.
AD-713 568 HC$3.00 MF$0.65

ATMOSPHERIC AND OCEANOGRAPHIC SUPPORT STUDIES FOR LASER RADAR EXPERIMENT ABOARD THE ADVANCE 2 DURING BOMEX.
Research Triangle Inst., Durham, N. C. Engineering and Environmental Sciences Div.
W. D. Bach, Jr., and J. R. Smith. Aug 70, 32p NASA-CR-66978
Contract NAS1-9161

Descriptors: *Environmental tests, *Oceanography, *Optical radar, Boundary layers, High altitude, Low altitude, Particle density (concentration), Radiosondes.

For abstract, see STAR 08 21.
N70-38552 HC$3.00 MF$0.65

17I. Radar Detection

CIRCUIT REALIZATION OF IMPEDANCE LOADING FOR CROSS SECTION REDUCTION,
Michigan Univ Ann Arbor Radiation Lab
E. Lawrence McMahon. Sep 70, 36p Rept nos. Scientific-8, 1363-7-T AFCRL-70-0514
Contract F19628-68-C-0071

Descriptors: (*Radar echo areas, Reduction), Electrical impedance, Circuits, Synthesis.
Identifiers: *Load impedance, *Negative impedance converters.

Techniques for realizing a reactance which is a decreasing function of frequency are discussed. A Negative Impedance Converter (NIC) circuit is analyzed and techniques given for compensating for imperfections and frequency dependence. An RC realization of the desired impedance is given, and it is demonstrated that this realization can be modified to compensate for phase shift in the NIC. An analytical and numerical analysis of a NIC based on amplifiers with 50 ohm input and output impedances is presented. (Author)
AD-713 161 HC$3.00 MF$0.65

VORTEX SIGNATURE RECOGNITION BY A DOPPLER RADAR,
Air Force Cambridge Research Labs L G Hanscom Field Mass
For primary bibliographic entry see Field 4B.
AD-713 372

ECHO AMPLIFICATION IN MAGNETIC MATERIALS WITH APPLICATION TO PULSE COMPRESSION RADAR,
Army Missile Command Redstone Arsenal Ala Physical Sciences Lab
For primary bibliographic entry see Field 20C.
AD-713 518 HC$3.00 MF$0.65

RADAR POLARIZATION DIVERSITY EFFECTS ON TARGET RERADIATED PHASE FRONT,
Army Missile Command Redstone Arsenal Ala
John L. Hatcher, and Carlton H. Cash. 1970, 15p

Descriptors: (*Radar tracking, Mathematical models), Backscattering, Radar targets, Polarization, Doppler radar, Errors, Simulation, Guided missile tracking systems, Target angle.

Polarization diversity as a technique to reduce the effects of target glint or angle fluctuation was investigated by means of a combined analytical and experimental program. The analytical portion of the program reported here was based on a simple two-element target model from which the angular error in the reradiated phase front was computed. The results of these computations showed that, within the constraints of the model, polarization diversity could reduce the angular tracking errors. The experimental program used a pulse Doppler conical scan tracking radar with a polarization-agile antenna, field tests conducted with actual targets showed an improvement in target tracking ability with polarization diversity as compared to linear polarization, either horizontal or vertical. Continuing effort in the area includes more sophisticated target models and associated computer simulation to more accurately represent analytically the true target situation. In addition, investigations are proceeding to adapt the polarization diversity techniques to monopulse radars and conduct further experimental evaluation of its effectiveness to reduce phase front errors. (Author)
AD-713 535 HC$3.00 MF$0.65

A LIGHTWEIGHT ELECTRONIC SCANNING RADAR,
Army Electronics Command Fort Monmouth N J Combat Surveillance Target Acquisition Systems Integration Lab
Harold N. Tate. 1970, 11p

Descriptors: (*Search radar, *Phased arrays), Electronic scanners, Combat surveillance, Doppler radar, Moving target indicators, Radar equipment, Display systems.
AD-713 583 HC$3.00 MF$0.65

RADAR SEA RETURN IN HIGH SEA STATES.
Final rept.,
Naval Research Lab Washington D C
J. C. Daley, W. T. Davis, and N. R. Mills. 25 Sep 70, 51p Rept no. NRL-7142

Descriptors: (*Radar reflections, Ocean waves), Surface roughness, Radar echo areas, Statistical analysis, Wind, Velocity, Radar clutter, Measurement.

In order to obtain a more exact specification of the variation of the radar cross section of the sea with increasing sea roughness, and to determine a worst-case condition for sea clutter, a high-sea-state clutter measurement program in the North Atlantic was conducted. Radar return was collected on four frequencies in both linear and cross polarizations, and the normalized radar section sigma sub o of the sea surface was obtained as a function of radar and surface parameters for the high sea states encountered. The study of the behavior of the median value of sigma sub o as a function of the radar parameters and sea conditions resulted in the following conclusions at high sea states characterized by winds of 20-50 knots and wave heights of 10-26 ft: (a) the value of sigma sub o is independent of wavelength for vertical polarization but maintains an inverse wavelength dependence for horizontal polarization, (b) the direct polarization ratio remains significnt for all wavelengths as the sea roughness increases and is a function of wavelength, (c) the value of sigma sub o is sensitive to wind direction, with consistently higher clutter observed in the upwind direction for all wavelengths and both direct polarizations, and (d) the value of sigma sub o does not increase significantly with wind velocity in the region 20-50 knots, indicating that sigma sub o approaches a maximum value, or 'saturation,' with increasing surface roughness. (Author)
AD-713 589 HC$3.00 MF$0.65

RADAR SET AN/PPS-17 (XN-1) FAILURE FREE DEVELOPMENT PROGRAM.
Interim development rept. 1-30 Sep 70 on Phase 2,
General Instrument Corp Hicksville N Y Electronic Systems Div
Walter Seidman, and Al Zecca. 30 Sep 70, 21p
Rept no. ESD-1158-IR-8
Contract N00039-70-C-3501
See also Report dated 31 Aug 70, AD-712 530.

Descriptors: (*Search radar, Reliability (Electronics)), Portable, Radar equipment, Klystrons, Power supplies, Radar antennas, Modules (Electronics).
Identifiers: AN/PPS-17 (XN-1).

Designing, manufacturing and testing of 20 High Reliability Radar AN/PPS-17 (XN-1), is proceeding satisfactorily. During the period the complete system, operating off a 12 volt power supply to simulate the battery, was field tested with excellent results. (Author)
AD-713 670 HC$3.00 MF$0.65

AN/PPS-18 (XN-1) ULTRA RELIABLE RADAR.
Interim development rept. 1-30 Sep 70 on Phase 2,
RCA Defense Electronic Products Moorestown N J Missile and Surface Radar Div
J. D. Frattura. 8 Oct 70, 27p
Contract N00039-70-C-3502

Descriptors: (*Doppler radar, Combat surveillance), X band, Portable, Search radar, Reliability (Electronics), Cost effectiveness.
Identifiers: AN/PPS-18 (XN-1).

The program covers the study, design, construction, test analysis and inspection of a complete and operative, highly reliable, relative failure-free version of the pulsed doppler surveillance AN/PPS-6 radar set. The radar set is intended to be a lightweight, miniaturized, X-band, pulse doppler combat surveillance radar. The basic purpose of this program is to develop a highly reliable radar set considering the overall cost of ownership when development, production and maintenance costs are taken into account while keeping the same general performance, form-factor and weight as the AN/PPS-6 radar. (Author)
AD-713 707 HC$3.00 MF$0.65

TEST AND EVALUATION OF IMPROVED AZIMUTH PULSE GENERATOR (APG).
Final rept. Apr 68-Jul 70,
National Aviation Facilities Experimental Center Atlantic City N J
Oliver D. Carlson. Oct 70, 23p Rept no. FAA-NA-70-60 FAA-RD-70-64

Descriptors: (*Radar antennas, Azimuth), (*Pulse generators, Azimuth), Digital-to-analog converters, Synchros.

Azimuth pulse generators and a digital-to-synchro converter were subjected to tests at the National Aviation Facilities Experimental Center to ascertain their compliance with engineering requirements and to determine their performance in supplying antenna azimuth position data to a Radar Video Data Processor (RVDP). The azimuth pulse generators were installed in the antenna pedestal of the experimental airport surveillance radar (ASR-5) facility, and the digital-to-synchro converter was installed at the radar display subsystem. Utilizing digital computer programs, RVDP output messages were tabulated and analyzed to determine precision in reporting antenna azimuth. Test results indicated that the azimuth pulse generators and the digital-to-synchro converter performed satisfactorily, and acceptably provided antenna azimuth position data to the RVDP. Difficulties encountered during the tests were related to the type of coupling between the antenna and the azimuth pulse generators, which resulted in a recommendation to use only a worm-gear method of coupling. (Author)
AD-713 718 HC$3.00 MF$0.65

THE FREQUENCY DEPENDENCE OF BACKSCATTER FROM ROUGH SURFACES.
Technical rept.,
Kansas Univ., Lawrence. Center for Research.
John W. Rouse, Jr. Sep 68, 162p CRES-TR-133-4
Contract DAAK02-68-C-0089, Grant NSF-GK-1153
Distribution Limitation now Removed.

Descriptors: (*Natural resources, Aerial reconnaissance), (*Mapping, Radar images), (*Radar reflections, Backscattering), Surface roughness, Broadband, Simulation, Radar images, Instrumentation, Sound signals, Terrain, Statistical analysis, Data processing systems.
Identifiers: Themis project, *Remote sensing.

The report describes use of a broad-spectrum acoustic simulation system to predict the behavior of broad-spectrum radar systems. Analysis of the rough-surface backscatter data verifies the predicted dependence of the frequency response of backscatter on the statistics of the illuminated surface. The measurement of the backscatter from object targets confirms the ability of broad-spectrum illumination to smooth the complex reradiation patterns characteristic of object targets. These data are collected in image form (B-scan), and this system capability offers considerable promise for further investigation of imaging radar applications of the broad-spectrum technique. (Author)
AD-847 275 HC$3.00 MF$0.65

PROJECT THEMIS: A CENTER FOR REMOTE SENSING.
Kansas Univ., Lawrence. Center for Research.
For primary bibliographic entry see Field 8B.
AD-847 276 HC$3.00 MF$0.65

PROJECT THEMIS: A CENTER FOR REMOTE SENSING.
Kansas Univ., Lawrence. Center for Research.
For primary bibliographic entry see Field 8B.
AD-853 884 HC$3.00 MF$0.65

PROJECT THEMIS: A CENTER FOR REMOTE SENSING.
Kansas Univ., Lawrence. Center for Research.
For primary bibliographic entry see Field 8B.
AD-869 511 HC$3.00 MF$0.65

GEOLOGIC EVALUATION OF RADAR IMAGERY OF FLIGHTS 100- B AND 100- C ACROSS THE CENTRAL SIERRA NEVADA, CALIFORNIA.
Geological Survey, Menlo Park, Calif.
For primary bibliographic entry see Field 8B.
For abstract, see STAR 08 21.
N70-38899 HC$3.00 MF$0.65

18. NUCLEAR SCIENCES AND TECHNOLOGY

18A. Fusion Devices (Thermonuclear)

PROPOSAL FOR A SHOCK-HEATED TOROIDAL Z-PINCH EXPERIMENT,
Los Alamos Scientific Lab., N. Mex.
For primary bibliographic entry see Field 20I.
For abstract, see NSA 24 20.
LA-4352 HC$3.00 MF$0.65

NUMERICAL SIMULATION OF THE WEIBEL INSTABILITY IN ONE AND TWO DIMENSIONS,
Los Alamos Scientific Lab., N. Mex.
For primary bibliographic entry see Field 20I.
For abstract, see NSA 24 20.
LA-4482 HC$3.00 MF$0.65

PRODUCTION OF PLASMAS BY LONG-WAVELENGTH LASERS,
Princeton Uuiv., N.J. Plasma Physics Lab.
For primary bibliographic entry see Field 20I.
For abstract, see NSA 24 20.
MATT-786 HC$3.00 MF$0.65

EXPERIMENTAL INVESTIGATION OF CUSPED CONTAINMENT GEOMETRIES CHALICE.
Stevens Inst. of Tech., Hoboken, N.J. Dept. of Physics.
For primary bibliographic entry see Field 20I.
For abstract, see NSA 24 20.
SIT-2582-34 HC$3.00 MF$0.65

18B. Isotopes

USE OF Rn/Ra RATIOS TO DETERMINE AIR/SEA GAS EXCHANGE AND VERTICAL MIXING IN THE OCEAN.
Teledyne Isotopes Palo Alto Calif Palo Alto Labs
For primary bibliographic entry see Field 8C.
AD-713 129 HC$3.00 MF$0.65

RESOLUTION OF A MULTICOMPONENT CASCADE WITH TWO KEY WEIGHTS AND MULTI-FEEDS AND WITHDRAWALS,
Atomic Energy Commission Combined Operations Planning, Oak Ridge, Tenn.
A. de la Garza. 1 Dec 69, 15p
Contract W-7405-eng-26

Descriptors: (*Gaseous diffusion process, *Uranium isotopes).

For abstract, see NSA 24 20.
AECOP-330 HC$3.00 MF$0.65

BIFOLD NUCLEAR POWER SOURCE,
Mound Lab., Miamisburg, Ohio.
For primary bibliographic entry see Field 18N.
For abstract, see NSA 24 20.
MLM-1357 HC$3.00 MF$0.65

STABLE ISOTOPE SALES: MOUND LABORATORY CUSTOMER AND SHIPMENT SUMMARIES, FY-1969,
Mound Lab., Miamisburg, Ohio.
M. J. Williams. 31 Jul 70, 21p
Contract AT (33-1)-GEN-53

Descriptors: (*Stable isotopes, Sales), Indexes (Documentation).

For abstract, see NSA 24 20.
MLM-1750 HC$3.00 MF$0.65

STRUCTURAL ANALYSIS OF SHIPPING CASKS. VOL. 8. EXPERIMENTAL STUDY OF THE STRESS-STRAIN PROPERTIES OF LEAD UNDER SPECIFIED IMPACT CONDITIONS.
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 18F.
For abstract, see NSA 24 20.
ORNL-TM-1312 (Vol.8) HC$3.00 MF$0.65

THERMAL CONDUCTIVITIES OF Tm_2O_3, Yb_2O_3, AND A Tm_2O_3-Yb_2O_3 MIXTURE,
Oak Ridge National Lab., Tenn.
E. E. Ketchen. Aug 70, 14p
Contract W-7405-eng-26

Descriptors: (*Thulium oxides, Thermal conductivity), (*Ytterbium oxides, Thermal conductivity), Mixtures, Radioisotope heat sources.

For abstract, see NSA 24 20.
ORNL-TM-3066 HC$3.00 MF$0.65

INVESTIGATION OF DEFORMATION IN RECTANGULAR Cs SOURCES,
Oak Ridge National Lab., Tenn.
N. C. Bradley, and C. L. Ottinger. Aug 70, 29p
Contract W-7405-eng-26

Descriptors: (*Radioisotope heat sources, *Cesium 137), Deformation, Sulfates, Contaminants, Degreasing, Leakage.

For abstract, see NSA 24 20.
ORNL-TM-3069 HC$3.00 MF$0.65

ISOTOPE PROGRAM (5000) PROGRESS REPORT FOR QUARTER ENDING JUNE 30, 1970,
Oak Ridge National Lab., Tenn.
J. H. Gillette. Aug 70, 10p
Contract W-7405-eng-26

Descriptors: (*Radioactive isotopes, Technical reports), (*Dosimeters, Design), Neutron flux, Isotope separation.

For abstract, see NSA 24 20.
ORNL-TM-3089 HC$3.00 MF$0.65

AEROSPACE NUCLEAR SAFETY PROGRAM.
Sandia Labs., Albuquerque, N. Mex.
For primary bibliographic entry see Field 18N.
For abstract, see NSA 24 20.
SC-PR-70-435 HC$3.00 MF$0.65

FURTHER DEVELOPMENT OF RADIOISOTOPE TECHNIQUES FOR MEASURING WATER MOVEMENT IN LARGE TREES,
Pacific Southwest Forest and Range Experiment Station, Berkeley, Calif.
For primary bibliographic entry see Field 2F.
For abstract, see NSA 24 20.
TID-25463 HC$3.00 MF$0.65

18C. Nuclear Explosions

STATIC DETERMINATION OF THE EQUATION-OF-STATE OF CEDAR CITY TONALITE.
Battelle Memorial Inst Columbus Ohio Columbus Labs
For primary bibliographic entry see Field 8G.
AD-713 175 HC$3.00 MF$0.65

FAR FIELD CHARACTERISTICS OF GROUND SHOCK INDUCED BY EXPLOSIONS,
Army Engineer Waterways Experiment Station Vicksburg Miss
J. L. Drake, and A. Sakurai. 1970, 9p

Descriptors: (*Nuclear explosions, *Shock waves), Motion, Shear stresses, Mathematical models, Elasticity, Velocity, Detonations, Structures, Explosion effects.
Identifiers: *Ground motion.

General formulae for the ground motions from an explosion source were derived and their results compared with high explosive and nuclear weapons test data. The comparisons show reasonably good agreement may be obtained by using a simple elastic description for the earth as long as the explosion is properly modeled. (Author)
AD-713 521 HC$3.00 MF$0.65

SIMULATION OF HIGH ALTITUDE IONIZED AIR WITH AN ARTIFICIAL DIELECTRIC,
Army Mobility Equipment Research and Development Center Fort Belvoir Va Electromagnetic Effects Lab
For primary bibliographic entry see Field 20N.
AD-713 531 HC$3.00 MF$0.65

A CONCEPT OF ROW CRATER ENHANCEMENT,
Army Engineer Nuclear Cratering Group Livermore Calif
Bruce B. Redpath. 1970, 15p

Descriptors: (*Nuclear industrial applications, *Cratering), Nuclear explosions, Inland waterways, Harbors, Simulation, Charges (Explosive), Special functions (Mathematical), Experimental data, Mathematical prediction.
Identifiers: Nuclear excavation, Yield (Nuclear explosions), *Crater enhancement.

Linear craters formed by the simultaneous detonation of a row of buried explosives will probably have a wider application than single charges in the explosive excavation of engineering structures such as canals, channels and harbors. Most cratering experience to date has been with single charges, and an analytical procedure for the design of a row of charges to excavate a crater with a specified configuration has been lacking. There are no digital computer codes having direct application to a row of charges as there are for single charges. This paper derives a simple relationship which can be used to design row charges with some assurance of achieving the desired result and with considerable flexibility in the choice of explosive yield of the individual charges. (Author)
AD-713 574 HC$3.00 MF$0.65

RESPONSE OF ROCK INCLUSIONS TO AIR BLAST.
Naval Civil Engineering Lab., Port Hueneme, Calif.
For primary bibliographic entry see Field 8G.
AD-872 810 HC$3.00 MF$0.65

THE GAMMA EMISSION OF RADIOACTIVE FALLOUT,
National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.
For primary bibliographic entry see Field 18H.
AEC-tr-7100 HC$3.00 MF$0.65

SEISMIC ACTIVITY IN SEPTEMBER 1969 NEAR THE RULISON NUCLEAR TEST SITE,
Coast and Geodetic Survey, Rockville, Md.
R. Navarro, and S. R. Brockman. 15 Jun 70, 19p
PNE-R-32

Descriptors: (*Nuclear explosions, Seismic waves), (*Natural gas, Gas production), Petroleum industry.
Identifiers: Rulison shot, Nuclear stimulation.

For abstract, see NSA 24 20.
CGS-746-5 HC$3.00 MF$0.65

SYMPOSIUM ON ENGINEERING WITH NUCLEAR EXPLOSIVES, LAS VEGAS, NEVADA, JANUARY 14-16, 1970. PROCEEDINGS.
American Nuclear Society, Hinsdale, Ill.

May 70, 858p*
See also Rept. no. CONF-700101- (Vol.2).

Descriptors: (*Nuclear excavation, Proceedings), (*Nuclear explosions, Underground explosions), Nuclear explosion effects, Cratering, Radioactivity, Rock mechanics, Soil mechanics, Petroleum industry, Crude oil, Natural gas.
Identifiers: Plowshare operation, Gasbuggy shot, Schooner shot, *Nuclear industrial applications, Rulison shot, Nuclear stimulation, Ground motion.

For abstract, see NSA 24 20.
CONF-700101- (Vol.1) HC$10.00 MF$0.65

SYMPOSIUM ON ENGINEERING WITH NUCLEAR EXPLOSIVES, LAS VEGAS, NEVADA, JANUARY 14-16, 1970. PROCEEDINGS.
American Nuclear Society, Hinsdale, Ill.

May 70, 927p*
See also Rept. no. CONF-700101- (Vol.1).

Descriptors: (*Nuclear excavation, Proceedings), (*Nuclear explosions, Underground explosions), Nuclear explosion effects, Seismology, Radioactivity, Mining engineering, Hydrogeology, Cratering, Geologic investigations.
Identifiers: Plowshare operation, Rulison shot, Aquarius project, Schooner shot, Torres Straight, Ground motion.

For abstract, see NSA 24 20.
CONF-700101- (Vol.2) HC$10.00 MF$0.65

EARLY RADIO FLASH FROM A LOW-ALTITUDE AIR BURST,
Los Alamos Scientific Lab., N.Mex.
B. R. Suydam. Aug 69, 21p
Contract W-7405-eng-36

Descriptors: (*Nuclear explosion effects, *Radio waves), Maxwells equations, Integral transformations, Integral calculus, Compton effect, Neutron scattering, Gamma rays.
Identifiers: Radio flash.

For abstract, see NSA 24 20.
LA-4245 HC$3.00 MF$0.65

OCEAN SURFACE EFFECTS GENERATED BY A NEARBY UNDERGROUND EXPLOSION AT THE AMCHITKA TEST.
Final rept.,
Tetra Tech, Inc., Pasadena, Calif.
R. C. Y. Koh, and D. Rosencrantz. 20 Apr 70, 39p
TC-174-1
Contract AT (26-1)-289

Descriptors: (*Nuclear explosions, Underground explosions), (*Ocean waves, Explosion effects), Bathythermograph data, Seismic waves, Shock waves, Photographic analysis, Computer programs, Aleutian Islands.
Identifiers: Milrow shot, Amchitka island.

For abstract, see NSA 24 20.
NVO-289-6 HC$3.00 MF$0.65

PROJECT RULISON. CER GEONUCLEAR CORPORATION'S PARTICIPATION IN THE SAFETY PROGRAM.
Austral Oil Co., Inc., Houston, Tex.

28 Jul 70, 23p
Contract AT (26-1)-429
Prepared in cooperation with CER Geonuclear Corp., Las Vegas, Nev.

Descriptors: (*Nuclear explosions, Underground explosions), (*Nuclear excavation, Safety), (*Natural gas, Gas production), Seismic waves, Mine surveys, Public health.
Identifiers: Rulison shot, Plowshare operation, Nuclear stimulation, Ground motion.

For abstract, see NSA 24 20.
PNE-R-31 HC$3.00 MF$0.65

THE SEDAN EVENT.
On-Site Radiological Safety rept.
Reynolds Electrical and Engineering Co., Inc., Mercury, Nev. Radiological Safety Div.

23 Oct 62, 62p Contract AT (29-2)-162

Descriptors: (*Nuclear excavation, Cratering), (*Radiation hazards, Safety), Nuclear explosions, Alluvium, Nuclear clouds, Fallout, Radiation measuring instruments, Dose rate, Underground explosions.
Identifiers: Plowshare operation, Sedan shot.

For abstract, see NSA 24 20.
PNE-203-F HC$3.00 MF$0.65

ENVIRONMENTAL SURVEILLANCE FOR PROJECT GASBUGGY PRODUCTION TEST PHASE.
Southwestern Radiological Health Lab., Las Vegas, Nev.
For primary bibliographic entry see Field 13B.
For abstract, see NSA 24 20.
SWRHL-100-r HC$3.00 MF$0.65

WEAPONS EFFECTS DISPLAY SYSTEM (WEDS MOD II): ROM ACCESSORY USER'S MANUAL,
California Univ., Livermore. Lawrence Radiation Lab.
For primary bibliographic entry see Field 9B.
For abstract, see NSA 24 20.
UCRL-50892 (Vol.3) HC$3.00 MF$0.65

PRECIPITATION SCAVENGING IN A LARGE-CLOUD DIFFUSION CODE,
California Univ., Livermore. Lawrence Radiation Lab.
For primary bibliographic entry see Field 18H.
For abstract, see NSA 24 20.
UCRL-72603 HC$3.00 MF$0.65

HYDRAULIC TESTING OF WELL HTH-23 IN CENTRAL NEVADA,
Geological Survey, Denver, Colo.
For primary bibliographic entry see Field 8G.
For abstract, see NSA 24 20.
USGS-474-23 HC$3.00 MF$0.65

HYDRAULIC TESTING AND SAMPLING OF HOLE Ue-1, IN CENTRAL NEVADA.
Geological Survey, Denver, Colo.
For primary bibliographic entry see Field 8G.
For abstract, see NSA 24 20.
USGS-474-77 HC$3.00 MF$0.65

18D. Nuclear Instrumentation

PRELIMINARY STUDIES OF THE EFFECTS OF FAST NEUTRONS ON THE OPTICAL PROPERTIES OF ANTHRACENE,
Wisconsin Univ., Madison. Dept. of Physics.
For primary bibliographic entry see Field 7E.
For abstract, see NSA 24 20.
COO-1105-159 HC$3.00 MF$0.65

THERMOLUMINESCENCE IN CaF2:nat AS A DOSIMETER FOR THE TERRESTRIAL SOLAR ULTRAVIOLET RADIATION ENVIRONMENT,
Wisconsin Univ., Madison. Dept. of Radiology.
For primary bibliographic entry see Field 6R.
For abstract, see NSA 24 20.
COO-1105-160 HC$3.00 MF$0.65

THE DOLLY FILM MEASURING SYSTEM,
Illinois Univ., Urbana. Dept. of Physics.
R. W. Downing, R. M. Brown, V. J. Simaitis, J. J. Wray, and D. R. Zander. Jun 70, 3p CONF-700902-1
Presented at the International Conference on Instrumentation for High Energy Physics, Dubna (USSR). Sep 70.

Descriptors: (*Positioning devices (Machinery), *Printers (Data processing)), (*Cathode ray tubes, Films), Bubble chambers.

For abstract, see NSA 24 20.
COO-1195-192 HC$3.00 MF$0.65

TESTS OF TLD-700 HIGH SENSITIVITY LiF RIBBON FOR LOW-LEVEL ENVIRONMENTAL RADIATION MEASUREMENTS,
New York Operations Office (AEC), N.Y. Health and Safety Lab.
For primary bibliographic entry see Field 6R.
For abstract, see NSA 24 20.
HASL-233 HC$3.00 MF$0.65

DEVELOPMENT OF A CONTINUOUS SAMPLER-MONITOR FOR THE LOFT CONTAINMENT ATMOSPHERE,
Idaho Nuclear Corp., Idaho Falls.
For primary bibliographic entry see Field 18G.
For abstract, see NSA 24 20.
IN-1309 HC$3.00 MF$0.65

PHOTON MONOCHROMATOR USING COMPTRON-SCATTERED GAMMA RAYS,
Ames Lab., Iowa.
For primary bibliographic entry see Field 20G.
For abstract, see NSA 24 20.
IS-2335 HC$3.00 MF$0.65

APPLICATIONS IN RADIOPROTECTION OF ALPHA AND BETA SPECTROMETRY BY SEMICONDUCTORS.
Application en Radioprotection de La Spectrometrie Alpha Et Beta Par Semiconducteurs
Commissariat A L Energie Atomique, Grenoble (France). Centre D'etudes Nucleaires.
H. De Choudens, and S. Descours. Mar 70, 48p
CEA-N-1158
Lang- in French

Descriptors: *Alpha particles, *Beta particles, *Radiation protection, *Semiconductor devices, *Spectrometers, Absorbers (materials), Computer programs, Emitters, Plutonium, Radiation counters, Radon, Terbium isotopes.

For abstract, see STAR 08 21.
N70-38025 HC$3.00 MF$0.65

COMPILATION OF UNITED STATES NUCLEAR STANDARDS. 6TH EDITION, 1969.
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 18I.
For abstract, see NSA 24 20.
ORNL-NSIC-76 HC$3.00 MF$0.65

METHODS OF MEASUREMENT FOR SEMICONDUCTOR MATERIALS, PROCESS CONTROL, AND DEVICES.
National Bureau of Standards, Washington, D.C.
For primary bibliographic entry see Field 20L.
PB-194 961 HC$0.65 MF$0.65

NUCLEAR MEASUREMENT OF SOIL PROPERTIES.
Virginia Highway Research Council, Charlottesville.
For primary bibliographic entry see Field 8M.
PB-195 182 HC$3.00 MF$0.65

OPERATION AND MAINTENANCE INSTRUCTIONS WITH ILLUSTRATED PARTS BREAKDOWN..T446 TRITIUM ALARM-MONITOR. INCLUDES T2071 POWER SUPPLY, T464 BATTERY CHARGER, AND T449 RADIOLOGICAL URINALYSIS KIT.
Sandia Labs., Albuquerque, N. Mex.
15 May 70, 114p

Descriptors: (*Radiation measuring instruments, *Tritium), Manuals, Maintenance.

For abstract, see NSA 24 20.
SC-M-70-512 HC$3.00 MF$0.65

BUILDUP OF GAS DISCHARGES IN THE PROPORTIONAL AND GEIGER REGION FOR USE IN CHARPAK CHAMBERS (Aufbau der Gasentladungen im Proportional-und Geigerbereich zur Anwendung in Charpak-Kammern),
Standford Linear Acclerator Center, Calif.
H. J. Stuckenberg. Jul 70, 33p
Trans. of Deutsche Elektronen-Synchrotron, Hamburg (West Germany) DESY-69/49 25p 1969, by R. Addis.

Descriptors: (*Proportional counters, Gas discharges), (*Geiger counters, Gas discharges), Ionizing radiation, Dosimetry, Charged particles, Translations, West Germany.
Identifiers: *Charpak chambers.

For abstract, see NSA 24 20.
SLAC-Trans-121 HC$3.00 MF$0.65

A COMPUTER PROGRAM FOR THE SMOOTHING AND DIFFERENTIATION OF DATA FROM MULTICHANNEL ANALYZERS,
California Univ., Berkeley. Lawrence Radiation Lab.
D. J. Gorman. Jun 70, 39p
Contract W-7405-eng-48

Descriptors: (*Pulse height analyzers, Gamma ray spectra), (*Alpha spectra, Data smoothing), Computer programs, Tables (Data), Least squares method, Curve fitting, Convolution integrals.

For abstract, see NSA 24 20.
UCRL-19903 HC$3.00 MF$0.65

INSTRUMENTATION FOR MONITORING OF 85Kr AND 3H IN NATURAL GAS,
California Univ., Livermore. Lawrence Radiation Lab.
C. T. Prevo, and V. C. Santomasimo. 26 May 70, 11p PNE-G-64

Descriptors: (*Natural gas, *Radioactive contaminants), Monitors, Calcium fluorides, Krypton isotopes, Tritium.
Identifiers: STALLKAT systems.

For abstract, see NSA 24 20.
UCRL-50882 HC$3.00 MF$0.65

WEAPONS EFFECTS DISPLAY SYSTEM (WEDS MOD II): ROM ACCESSORY USER'S MANUAL,
California Univ., Livermore. Lawrence Radiation Lab.
For primary bibliographic entry see Field 9B.
For abstract, see NSA 24 20.
UCRL-50892 (Vol.3) HC$3.00 MF$0.65

18E. Nuclear Power Plants

HERMETICALLY SEALED PUMPS IN NUCLEAR PROPULSION PLANTS,
Naval Intelligence Command Alexandria Va Translation Div
For primary bibliographic entry see Field 13K.
AD-713 267 HC$3.00 MF$0.65

ANALOG SIMULATION IN NUCLEAR POWER ENGINEERING,
Naval Intelligence Command Alexandria Va Translation Div
For primary bibliographic entry see Field 18I.
AD-713 273 HC$3.00 MF$0.65

HEAT EXCHANGERS IN NUCLEAR POWER PLANTS,
Naval Intelligence Command Alexandria Va Translation Div
For primary bibliographic entry see Field 18I.
AD-713 423 HC$3.00 MF$0.65

MARINE ATOMIC STEAM-GENERATING INSTALLATIONS,
Naval Intelligence Command Alexandria Va Translation Div
For primary bibliographic entry see Field 21F.
AD-713 426 HC$3.00 MF$0.65

STUDIES ON THE BIOLOGICAL EFFECTS OF THERMAL DISCHARGES FROM NUCLEAR REACTORS TO THE COLUMBIA RIVER AT HANFORD,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
For primary bibliographic entry see Field 6F.
For abstract, see NSA 24 20.
BNWL-SA-3465 HC$3.00 MF$0.65

ELK RIVER REACTOR. OPERATING AUTHORIZATION NO. DPRA-3, AMENDMENT 1.
Division of Reactor Licensing (AEC), Washington, D.C.

6 Aug 70, 6p

Descriptors: (*Nuclear power plants, Licenses), Minnesota.
Identifiers: Elk River power reactor.

For abstract, see NSA 24 20.
DOCKET-1151-38 HC$3.00 MF$0.65

LA CROSSE BOILING WATER REACTOR. ANALYSIS OF CRITICAL REGIONS OF MAIN CIRCULATION AND FEEDWATER PIPING. BOOK 2. FEEDWATER NOZZLE THERMAL SLEEVE.
Teledyne Materials Research Co., Waltham, Mass.

26 Mar 70, 55p E-1236 (a)-Bk-2
Contract AT (11-1)-850
Prepared in cooperation with Allis-Chalmers, Atomic Energy Div., Bethesda, Md. See also DOCKET-1155-63.

Descriptors: (*Nuclear power plants, Pipes (Tubes)), Wisconsin.
Identifiers: La Crosse boiling water reactor.

For abstract, see NSA 24 20.
DOCKET-1155-62 HC$3.00 MF$0.65

LA CROSSE BOILING WATER REACTOR. ANALYSIS OF CRITICAL REGIONS OF MAIN CIRCULATION AND FEEDWATER PIPING. BOOK 3. FEEDWATER NOZZLE: MAIN CIRCULATION ELBOW INTERSECTION.
Teledyne Materials Research Co., Waltham, Mass.

26 Mar 70, 88p E-1236 (a) (Bk.3)
Contract AT (11-1)-850
Prepared in cooperation with Allis-Chalmers, Atomic Energy Div., Bethesda, Md. See also Rept. no. DOCKET-1155-61.

Descriptors: (*Nuclear power plants, Pipes (Tubes)), Wisconsin.
Identifiers: La Crosse boiling water reactor.

For abstract, see NSA 24 20.
DOCKET-1155-63 HC$3.00 MF$0.65

LA CROSSE BOILING WATER REACTOR PRESSURE VESSEL: INVESTIGATION OF A LAMINAR INDICATION IN THE PLATE.
Topical rept. no. 9.
Southwest Research Inst., San Antonio, Tex.

29 Apr 70, 36p SwRI-1228P11-13
Contract AT (11-1)-1228

Descriptors: (*Nuclear power plants, Pressure vessels), Wisconsin.
Identifiers: La Crosse boiling water reactor.

For abstract, see NSA 24 20.
DOCKET-1155-64 HC$3.00 MF$0.65

LA CROSSE BOILING WATER REACTOR.
LACBWR Incident rept.
Dairyland Power Cooperative, La Crosse, Wis.

11 Aug 70, 2p DPC-70-11

Descriptors: (*Nuclear power plants, Pumps), Wisconsin.
Identifiers: La Crosse boiling water reactor.

For abstract, see NSA 24 20.
DOCKET-1155-66 HC$3.00 MF$0.65

LA CROSSE BOILING WATER REACTOR.
LACBWR Incident rept.
Dairyland Power Cooperative, La Crosse, Wis.

10 Aug 70, 3p DPC-70-12

Descriptors: (*Nuclear power plants, Nuclear reactor safety), Wisconsin.
Identifiers: La Crosse boiling water reactor.

For abstract, see NSA 24 20.
DOCKET-1155-67 HC$3.00 MF$0.65

LA CROSSE BOILING WATER REACTOR.
Monthly operating rept. Apr 70.
Dairyland Power Cooperative, La Crosse, Wis.

20 Aug 70, 28p DPC-851-10
Contract AT (11-1)-851

Descriptors: (*Nuclear power plants, Nuclear reactor engineering), Wisconsin.
Identifiers: La Crosse boiling water reactor.

For abstract, see NSA 24 20.
DOCKET-1155-68 HC$3.00 MF$0.65

INDIAN POINT STATION, UNIT NO. 1. TECHNICAL SPECIFICATIONS, TEMPORARY AMENDMENT TO PROVIDE ACCESS.
Consolidated Edison Co. of New York, Inc., New York.

7 Aug 70, 2p

Descriptors: (*Nuclear power plants, Licenses), New York.
Identifiers: Indian Point power reactor.

For abstract, see NSA 24 20.
DOCKET-50003-47 HC$3.00 MF$0.65

ENRICO FERMI ATOMIC POWER PLANT.
Operations rept. Apr 70.
Power Reactor Development Co., Detroit, Mich.

11 Aug 70, 10p PRDC-EF-80

Descriptors: (*Nuclear power plants, Nuclear reactor engineering), Michigan.
Identifiers: Fermi fast breeder reactor.

For abstract, see NSA 24 20.
DOCKET-50016-75 HC$3.00 MF$0.65

ENRICO FERMI ATOMIC POWER PLANT.
Operations rept. May 70.
Power Reactor Development Co., Detroit, Mich.

11 Aug 70, 8p PRDC-EF-81

Descriptors: (*Nuclear power plants, Nuclear reactor engineering), Michigan.
Identifiers: Fermi fast breeder reactor.

For abstract, see NSA 24 20.
DOCKET-50016-76 HC$3.00 MF$0.65

YANKEE NUCLEAR POWER STATION.
Operation rept. no. 115, Jul 70.
Yankee Atomic Electric Co., Westboro, Mass.

20 Aug 70, 8p

Descriptors: (*Nuclear power plants, Nuclear reactor engineering), Massachusetts.
Identifiers: Yankee power reactor.

For abstract, see NSA 24 20.
DOCKET-50029-126 HC$3.00 MF$0.65

SAXTON REACTOR. TECHNICAL SPECIFICATIONS CHANGE REQUEST NO. 37.
Saxton Nuclear Experimental Corp., Pa.

18 Aug 70, 4p

Descriptors: (*Nuclear power plants, Nuclear materials management), Pennsylvania.
Identifiers: Saxton power reactor.

For abstract, see NSA 24 20.
DOCKET-50146-58 HC$3.00 MF$0.65

SAXTON REACTOR. LICENSE NO. DPR-4. TECHNICAL SPECIFICATIONS CHANGE NO. 37.
Division of Reactor Licensing (AEC), Washington, D.C.

24 Aug 70, 2p

Descriptors: (*Nuclear power plants, Licenses), Pennsylvania.
Identifiers: Saxton power reactor.

For abstract, see NSA 24 20.
DOCKET-50146-59 HC$3.00 MF$0.65

BIG ROCK POINT NUCLEAR PLANT. CONTAINMENT LEAK RATE TEST.
Special rept. no. SR-11.
Consumers Power Co., Jackson, Mich.

10 Aug 70, 17p

Descriptors: (*Nuclear power plants, Nuclear reactor containment), Michigan.
Identifiers: Big Rock Point power reactor.

For abstract, see NSA 24 20.
DOCKET-50155-46 HC$3.00 MF$0.65

PEACH BOTTOM ATOMIC POWER STATION, UNIT 1.
Monthly operations rept. no. 52, Jun 70.
Philadelphia Electric Co., Pa.

20 Aug 70, 25p

Descriptors: (*Nuclear power plants, Nuclear reactor engineering), Pennsylvania.
Identifiers: Peach Bottom power reactor.

For abstract, see NSA 24 20.
DOCKET-50171-54 HC$3.00 MF$0.65

SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 1.
Operation rept. May 68.
Southern California Edison Co., Los Angeles.

Jun 68, 5p NYO-3270-14
Contract AT (30-1)-3270

Descriptors: (*Nuclear power plants, Nuclear reactor engineering), California.
Identifiers: San Onofre power reactor.

For abstract, see NSA 24 20.
DOCKET-50206-84 HC$3.00 MF$0.65

SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 1.
Operation rept. Dec 68.
Southern California Edison Co., Los Angeles.

Jan 69, 6p NYO-3270-21
Contract AT (30-1)-3270

Descriptors: (*Nuclear power plants, Nuclear reactor engineering), California.
Identifiers: San Onofre power reactor.

For abstract, see NSA 24 20.
DOCKET-50206-85 HC$3.00 MF$0.65

SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 1.
Operation rept. Jan 69.
Southern California Edison Co., Los Angeles.

Feb 69, 6p NYO-3270-22
Contract AT (30-1)-3270

Descriptors: (*Nuclear power plants, Nuclear reactor engineering), California.
Identifiers: San Onofre power reactor.

For abstract, see NSA 24 20.
DOCKET-50206-86 HC$3.00 MF$0.65

SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 1. APPLICATION OF PERMANENT OPERATING LICENSE.
Preliminary safety analysis rept. amendment 19.
Southern California Edison Co., Los Angeles.

28 Jul 70, 83p

Descriptors: (*Nuclear power plants, Nuclear reactor safety), California.
Identifiers: San Onofre power reactor.

For abstract, see NSA 24 20.
DOCKET-50206-87 HC$3.00 MF$0.65

CONNECTICUT YANKEE ATOMIC POWER PLANT. REPAIR AND INSPECTION OF STEAM GENERATOR PRIMARY NOZZLE SAFE-ENDS, MAY-JUNE 1970.
Final rept.
Westinghouse Electric Corp., Tampa, Fla.

15 Jul 70, 11p
Prepared in cooperation with Connecticut Yankee Atomic Power Co., Westboro, Mass.

Descriptors: (*Nuclear power plants, Nuclear reactor safety systems), Connecticut.
Identifiers: Connecticut Yankee power reactor.

For abstract, see NSA 24 20.
DOCKET-50213-71 HC$3.00 MF$0.65

CONNECTICUT YANKEE ATOMIC POWER PLANT.
Operation rept. no. 70-7, Jul 70.
Connecticut Yankee Atomic Power Co., Haddam.

24 Aug 70, 13p NYO-3250-50
Contract AT (30-1)-3250

Descriptors: (*Nuclear power plants, Nuclear reactor engineering), Connecticut.
Identifiers: Connecticut Yankee power reactor.

For abstract, see NSA 24 20.
DOCKET-50213-72 HC$3.00 MF$0.65

OYSTER CREEK NUCLEAR POWER PLANT, UNIT NO. 1.
Semiannual rept. no. 2, 1 Jan-30 Jun 70.
Jersey Central Power and Light Co., Morristown, N.J.

14 Jul 70, 21p

Descriptors: (*Nuclear power plants, Nuclear reactor engineering), New Jersey.
Identifiers: Oyster Creek power reactor.

For abstract, see NSA 24 20.
DOCKET-50219-100 HC$3.00 MF$0.65

OYSTER CREEK NUCLEAR POWER PLANT, UNIT NO. 1. NONDESTRUCTIVE TESTING REPORT FOR SELECTED BALANCE OF PLANT SYSTEMS OUTSIDE OF PRIMARY CONTAINMENT.
Jersey Central Power and Light Co., Morristown, N.J.

Jul 70, 19p

Descriptors: (*Nuclear power plants, Nondestructive tests), New Jersey.
Identifiers: Oyster Creek power reactor.

For abstract, see NSA 24 20.
DOCKET-50219-99 HC$3.00 MF$0.65

NINE MILE POINT NUCLEAR STATION. REQUEST FOR ADDITIONAL INFORMATION PERTAINING TO APPLICATION FOR POWER INCREASE.
Division of Reactor Licensing (AEC), Washington, D.C.

27 Aug 70, 4p

Descriptors: (*Nuclear power plants, Nuclear reactor engineering), New York.
Identifiers: Nine Mile Point power reactor.

For abstract, see NSA 24 20.
DOCKET-50220-48 HC$3.00 MF$0.65

SOUTHWEST EXPERIMENTAL FAST OXIDE REACTOR. MALFUNCTION OF THE EMERGENCY ELECTRICAL SYSTEM TIE BREAKERS.
General Electric Co., Sunnyvale, Calif. Breeder Reactor Development Operation.

5 Aug 70, 3p

Descriptors: (*Nuclear power plants, Failure), Arkansas.
Identifiers: Southwest experimental fast oxide reactor.

For abstract, see NSA 24 20.
DOCKET-50231-52 HC$3.00 MF$0.65

DRESDEN NUCLEAR POWER STATION, UNIT 2. PROPOSED CHANGE NO. 4 TO APPENDIX OF DPR-19, SUPPLEMENT NO. 2.
Commonwealth Edison Co., Chicago, Ill.

11 Aug 70, 3p

Descriptors: (*Nuclear power plants, Licenses), Illinois.
Identifiers: Dresden power reactor.

For abstract, see NSA 24 20.
DOCKET-50237-66 HC$3.00 MF$0.65

INDIAN POINT NUCLEAR GENERATING UNIT NO. 2. OPERATING LICENSE STAGE.
Applicant's Environmental rept.
Consolidated Edison Co. of New York, Inc., New York.

6 Aug 70, 58p

Descriptors: (*Nuclear power plants, Health physics), New York.
Identifiers: Indian Point power reactor.

For abstract, see NSA 24 20.
DOCKET-50247-39 HC$3.00 MF$0.65

INDIAN POINT NUCLEAR GENERATING UNIT NO. 2.
Preliminary safety analysis rept. Amendment 23.
Consolidated Edison Co. of New York, Inc., New York.

13 Aug 70, 221p
Includes Final Facility Description and Safety Analysis report, Supplement 13.

Descriptors: (*Nuclear power plants, Nuclear reactor safety), New York.
Identifiers: Indian Point power reactor.

For abstract, see NSA 24 20.
DOCKET-50247-40 HC$3.00 MF$0.65

DRESDEN NUCLEAR POWER STATION, UNIT 3. HYDROGEN GENERATION IN A BOILING WATER REACTOR.
Preliminary safety analysis rept. Amendment 23.
Commonwealth Edison Co., Chicago, Ill.

11 Aug 70, 52p

Descriptors: (*Nuclear power plants, Hydrogen), Illinois.
Identifiers: Dresden power reactor.

For abstract, see NSA 24 20.
DOCKET-50249-39 HC$3.00 MF$0.65

TURKEY POINT PLANT, UNITS NO. 3 AND NO. 4.
Preliminary safety analysis rept. Amendment 22, Suppl. 22.
Florida Power and Light Co.

12 Aug 70, 209p DOCKET-50251-26

Descriptors: (*Nuclear power plants, Nuclear reactor safety), Florida.
Identifiers: Turkey Point power reactor.

For abstract, see NSA 24 20.
DOCKET-50250-28 HC$3.00 MF$0.65

TURKEY POINT PLANT, UNITS NO. 3 AND NO. 4.
Preliminary safety analysis rept. Amendment 23, Suppl. 23.
Florida Power and Light Co.

25 Aug 70, 71p DOCKET-50251-27

Descriptors: (*Nuclear power plants, Nuclear reactor safety), Florida.
Identifiers: Turkey Point power reactor.

For abstract, see NSA 24 20.
DOCKET-50250-29 HC$3.00 MF$0.65

PALISADES PLANT. PROVISIONAL CONSTRUCTION PERMIT NO. CPPR-25: EXTENSION OF COMPLETION DATE.
Division of Reactor Licensing (AEC), Washington, D.C.

28 Aug 70, 3p

Descriptors: (*Nuclear power plants, Licenses), Michigan.
Identifiers: Palisades power reactor.

For abstract, see NSA 24 20.
DOCKET-50255-28 HC$3.00 MF$0.65

BROWNS FERRY NUCLEAR PLANT, UNITS 1 AND 2. BASED ON PRECEDENT OF UNIT 3, BAFFLES WILL BE REMOVED FROM SUPPRESSION CHAMBERS OF UNITS 1 AND 2.
Tennessee Valley Authority, Chattanooga. Office of Power.

1970, 1P DOCKET-50260-12

Descriptors: (*Nuclear power plants, Nuclear reactor containment), Alabama.
Identifiers: Browns Ferry power reactor.

For abstract, see NSA 24 20.
DOCKET-50259-12 HC$3.00 MF$0.65

H. B. ROBINSON UNIT NO. 2. BASIS FOR REVISION IN SAFETY INJECTION PUMP PERFORMANCE. TECHNICAL SPECIFICATIONS.
Carolina Power and Light Co., Raleigh, N.C.

12 Aug 70, 14p

Descriptors: (*Nuclear power plants, Pumps), South Carolina.
Identifiers: H B Robinson power reactor.

For abstract, see NSA 24 20.
DOCKET-50261-41 HC$3.00 MF$0.65

H. B. ROBINSON UNIT NO. 2. ADDITIONAL INFORMATION CONCERNING SEISMIC ANALYSIS OF CLASS I PIPING AND EQUIPMENT, ADDENDUM A.
Carolina Power and Light Co., Raleigh, N.C.

18 Aug 70, 3p

Descriptors: (*Nuclear power plants, Shock waves), Pipes (Tubes), South Carolina.
Identifiers: H B Robinson power reactor.

For abstract, see NSA 24 20.
DOCKET-50261-42 HC$3.00 MF$0.65

POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2. ENVIRONMENTAL CONSIDERATIONS.
Division of Reactor Licensing (AEC), Washington, D.C.

7 Aug 70, 16p DOCKET-50301-23

Descriptors: (*Nuclear power plants, Health physics), Wisconsin.
Identifiers: Point Beach power reactor.

For abstract, see NSA 24 20.
DOCKET-50266-27 HC$3.00 MF$0.65

OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3.
Preliminary safety analysis rept. amendment 17.
Duke Power Co., Charlotte, N.C.

11 Aug 70, 194p DOCKET-50270-21, DOCKET-50287-18
Includes final safety analysis report Rev. 9.

Descriptors: (*Nuclear power plants, Nuclear reactor safety), South Carolina.
Identifiers: Oconee power reactor.

For abstract, see NSA 24 20.
DOCKET-50269-21 HC$3.00 MF$0.65

VERMONT YANKEE NUCLEAR POWER STATION.
Preliminary safety analysis rept. amendment 14, suppl.
Vermont Yankee Nuclear Power Corp., Rutland.

11 Aug 70, 14p

Descriptors: (*Nuclear power plants, Nuclear reactor safety), Vermont.
Identifiers: Vermont Yankee power reactor.

For abstract, see NSA 24 20.
DOCKET-50271-26 HC$3.00 MF$0.65

SURRY POWER STATION, UNITS 1 AND 2. NORTH ANNA POWER STATION, UNITS 1 AND 2. DEFICIENCIES OF PRESSURE VESSELS FABRICATION PROCEDURES.
Division of Compliance (AEC), Washington, D.C.

14 Aug 70, 3p DOCKET-50281-26, DOCKET-50338-22

Descriptors: (*Nuclear power plants, Pressure vessels), Virginia.
Identifiers: Surry power reactor.

For abstract, see NSA 24 20.
DOCKET-50280-26 HC$3.00 MF$0.65

PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2. DEFICIENCIES OF PRESSURE VESSEL FABRICATION PROCEDURES.
Division of Compliance (AEC), Washington, D.C.

13 Aug 70, 3p DOCKET-50306-21

Descriptors: (*Nuclear power plants, Pressure vessels), Minnesota.
Identifiers: Prairie Island power reactor.

For abstract, see NSA 24 20.
DOCKET-50282-21 HC$3.00 MF$0.65

FORT CALHOUN STATION, UNIT NO. 1.
Preliminary safety analysis rept. amendment 19.
Omaha Public Power District, Nebr.

13 Aug 70, 215p
Includes final safety analysis report, supplement 2.

Descriptors: (*Nuclear power plants, Nuclear safety), Nebraska.
Identifiers: Fort Calhoun power reactor.

For abstract, see NSA 24 20.
DOCKET-50285-26 HC$3.00 MF$0.65

FORT CALHOUN STATION, UNIT NO. 1. MISPLACED REINFORCING STEEL CONTAINMENT WALL POURS CW-4 AND CW-5.
Omaha Public Power District, Nebr.

20 Aug 70, 2p

Descriptors: (*Nuclear power plants, Nuclear reactor containment), Nebraska.
Identifiers: Fort Calhoun power reactor.

For abstract, see NSA 24 20.
DOCKET-50285-27 HC$3.00 MF$0.65

KEWAUNEE NUCLEAR POWER PLANT. COMPLIANCE WITH APPLICABLE WATER QUALITY STANDARDS.
Wisconsin Public Service Corp., Green Bay.

5 Aug 70, 3p

Descriptors: (*Nuclear power plants, Health physics), Wisconsin.
Identifiers: Kewaunee power reactor.

For abstract, see NSA 24 20.
DOCKET-50305-8 HC$3.00 MF$0.65

MIDLAND PLANT, UNITS 1 AND 2.
Preliminary safety analysis rept. amendment 15.
Consumers Power Co., Jackson, Mich.

14 Aug 70, 4p DOCKET-50330-18

Descriptors: (*Nuclear power plants, Nuclear reactor safety), Michigan.
Identifiers: Midland power reactor.

For abstract, see NSA 24 20.
DOCKET-50329-19 HC$3.00 MF$0.65

MILLSTONE NUCLEAR POWER STATION, UNIT NO. 2. SAFETY EVALUATION.
Division of Reactor Licensing (AEC), Washington, D.C.

7 Aug 70, 96p

Descriptors: (*Nuclear power plants, Nuclear reactor safety), Connecticut.
Identifiers: Millstone Point power reactor.

For abstract, see NSA 24 20.
DOCKET-50336-18 HC$3.00 MF$0.65

NORTH ANNA POWER STATION, UNITS 1 AND 2.
Preliminary safety analysis rept. amendment 11.
Virginia Electric and Power Co., Richmond.

12 Aug 70, 50p DOCKET-50339-20

Descriptors: (*Nuclear power plants, Nuclear reactor safety), Virginia.
Identifiers: North Anna power reactor.

For abstract, see NSA 24 20.
DOCKET-50338-21 HC$3.00 MF$0.65

DAVIS-BESSE NUCLEAR POWER STATION.
Preliminary safety analysis rept., amendment 8.
Toledo Edison Co., Ohio.

7 Aug 70, 239p

Descriptors: (*Nuclear power plants, Nuclear reactor safety), Ohio.
Identifiers: Davis-Besse power reactor.

For abstract, see NSA 24 20.
DOCKET-50346-12 HC$3.00 MF$0.65

DAVIS-BESSE NUCLEAR POWER STATION.
Preliminary safety analysis rept. amendment 9.
Toledo Edison Co., Ohio.

13 Aug 70, 4p

Descriptors: (*Nuclear power plants, Nuclear reactor safety), Ohio.
Identifiers: Davis-Besse power reactor.

For abstract, see NSA 24 20.
DOCKET-50346-13 HC$3.00 MF$0.65

DAVIS-BESSE NUCLEAR POWER STATION.
Applicants' environmental rept., construction permit stage.
Toledo Edison Co., Ohio.

3 Aug 70, 113p

Descriptors: (*Nuclear power plants, Health physics), Ohio.
Identifiers: Davis-Besse power reactor.

For abstract, see NSA 24 20.
DOCKET-50346-14 HC$3.00 MF$0.65

DAVIS-BESSE NUCLEAR POWER STATION. ACRS REPORT.
Atomic Energy Commission, Washington, D.C. Advisory Committee on Reactor Safeguards.

27 Aug 70, 5p

Descriptors: (*Nuclear power plants, Nuclear reactor safety), Ohio.
Identifiers: Davis-Besse power reactor.

For abstract, see NSA 24 20.
DOCKET-50346-15 HC$3.00 MF$0.65

DAVIS-BESSE NUCLEAR POWER STATION.
Preliminary safety analysis rept. amendment 10.
Toledo Edison Co., Ohio.

27 Aug 70, 57p

Descriptors: (*Nuclear power plants, Nuclear reactor safety), Ohio.
Identifiers: Davis-Besse power reactor.

For abstract, see NSA 24 20.
DOCKET-50346-16 HC$3.00 MF$0.65

JOSEPH M. FARLEY NUCLEAR PLANT, UNITS 1 AND 2. PRELIMINARY SAFETY ANALYSIS REPORT, AMENDMENT 3.
Alabama Power Co., Birmingham.

17 Aug 70, 158p DOCKET-50364-2

Descriptors: (*Nuclear power plants, Nuclear reactor safety), Alabama.
Identifiers: Joseph M Farley power reactor.

For abstract, see NSA 24 20.
DOCKET-50348-8 HC$3.00 MF$0.65

EDWIN I. HATCH NUCLEAR PLANT, UNIT 2. RECEIPT OF APPLICATION FOR CONSTRUCTION PERMIT AND OPERATING LICENSE.
Division of Reactor Licensing (AEC), Washington, D.C.

26 Aug 70, 3p

Descriptors: (*Nuclear power plants, Licenses), Georgia.
Identifiers: Edwin I Hatch power reactor.

For abstract, see NSA 24 20.
DOCKET-50366-1 HC$3.00 MF$0.65

EARTHQUAKES AND NUCLEAR POWER PLANT DESIGN,
Oak Ridge National Lab., Tenn.
T. F. Lomenick. Jul 70, 216p
Contract W-7405-eng-26

Descriptors: (*Nuclear power plants, Design), (*Nuclear reactor engineering, Earthquake resistant structures), Nuclear reactor safety, Urban areas, Standards, Site surveys, Nuclear reactor accidents, Fission products, Nuclear reactor control.

For abstract, see NSA 24 20.
ORNL-NSIC-28 HC$3.00 MF$0.65

ECONOMIC COMPARISON OF SINGLE-PURPOSE AND DUAL-PURPOSE NUCLEAR PLANTS FOR SUPPLYING WIDELY SEPARATED POWER AND WATER LOADS,
Oak Ridge National Lab., Tenn.
H. I. Bowers. Aug 70, 69p
Contract W-7405-eng-26

Descriptors: (*Desalting, *Nuclear power plants), Water resources, Economics, Cost estimates, Electric power transmission.

For abstract, see NSA 24 20.
ORNL-TM-2899 HC$3.00 MF$0.65

18F. Radiation Shielding and Protection

BIOLOGICAL SHIELDING OF MARITIME REACTORS,
National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.
D. L. Broder, K. K. Popkov, and S. M. Rubanov. 1970, 364p SFCSI-AEC (TT-70-50006), TT-70-50006
Trans. of mono. Biologicheskaya Zashchita Sudovykh Reaktorov, Leningrad, 1964 408p, by G. D. Myers.

Descriptors: (*Radiation shielding, *Maritime reactors), Radiation effects, Fast neutrons, Gamma rays, Dosimetry, Particle interactions, Translations, USSR.

Contents: The interaction of radiation with matter; The effects of radiation on man, and the fundamentals of dosimetry; Radiation effects in materials, properties of shielding materials; Sources of penetrating radiation in reactors; The influence of source geometry on the space distribution of radiation fluxes; The penetration of fast neutrons; The space energy distribution of neutrons in shields; The calculation of gamma-ray attenuation; Capture gamma rays and heat release; Radiation streaming through channels in shields; Activation problems; Radiation safety on nuclear propelled ships; Maritime reactor shields: design principles and plant layout.
AEC-tr-7097 HC$3.00 MF$0.65

SHIELDING IN NUCLEAR SHIPS,
Division of Technical Information Extension (AEC), Oak Ridge, Tenn.
Iwao Kataoka. 1970, 11p
Trans. of Japan Atomic Energy Society Meeting, Paper Tokyo, 12-13 Feb 70 n.d., n.p.

Descriptors: (*Radiation shielding, *Nuclear powered ships), Efficiency, Design, Performance, Translations, Japan.

For abstract, see NSA 24 20.
CONF-700211-2 HC$3.00 MF$0.65

STATISTICAL THEORY OF INELASTIC NEUTRON ENERGY SPECTRA.
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
B. J. Henderson, and C. E. Wuller, Jr.. 16 Sep 69, 29p NASA-TM-X-53913, MSFC-IN-SSL-N-68-14

Descriptors: *Inelastic scattering, *Neutron spectra, *Radiation shielding, *Spacecraft shielding, *Statistical analysis, Neutron scattering, Nuclear reactions.

For abstract, see STAR 08 21.
N70-38168 HC$3.00 MF$0.65

SHIELDING BENCHMARK PROBLEMS,
Oak Ridge National Lab., Tenn.
A. E. Profio. Aug 70, 44p ANS-SD-9-Suppl-1
Contract W-7405-eng-26

Descriptors: (*Radiation shielding, Technical reports), Neutron spectra, Fission neutrons, Gamma rays, Dosimetry, Monte Carlo method.

For abstract, see NSA 24 20.
ORNL-RSIC-25 (Suppl.1) HC$3.00 MF$0.65

STRUCTURAL ANALYSIS OF SHIPPING CASKS. VOL. 8. EXPERIMENTAL STUDY OF THE STRESS-STRAIN PROPERTIES OF LEAD UNDER SPECIFIED IMPACT CONDITIONS.
Master's thesis,
Oak Ridge National Lab., Tenn.
J. H. Evans. Aug 70, 105p
Contract W-7405-eng-26

Descriptors: (*Radioactive isotopes, *Radiation shielding), (*Shipping containers, Structural analysis), (*Lead (Metal), Impact tests), Stress strain diagrams, Loads (Forces), Barrels (Containers), Tests, Performance, Computer programs, Theses.
Identifiers: IBM 360 computers, FORTRAN.

For abstract, see NSA 24 20.
ORNL-TM-1312 (Vol.8) HC$3.00 MF$0.65

18G. Radioactive Wastes and Fission Products

WASTE SOLIDIFICATION DEMONSTRATION PROGRAM: CHARACTERIZATION OF NON-RADIOACTIVE SAMPLES OF SOLIDIFIED HIGH-LEVEL WASTE,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
R. J. Thompson, J. E. Mendel, and J. H. Kleinpeter. Jun 70, 86p
Contract AT (45-1)-1830

Descriptors: (*Radioactive waste processing, Solidification), Phosphate glass, Storage.
Identifiers: *Solid radioactive wastes.

For abstract, see NSA 24 20.
BNWL-1393 HC$3.00 MF$0.65

THE RETENTION OF FISSION PRODUCTS IN DISPERSED FUELS. PROJECT DRAGON,
Atomic Energy Establishment, Winfrith (England).
F. P. O. Ashworth. Jan 65, 24p CONF-65042-2

Descriptors: (*High temperature gas cooled reactors, Coated fuel particles), (*Fission products, Concentrating), Graphite, Rare gases, Nuclear reactor coolants, Reactor fuels, Coatings.
Identifiers: Dragon project.

For abstract, see NSA 24 20.
DP-Report-308 HC$3.00 MF$0.65

IODINE RETENTION STUDIES.
Progress rept. Jul-Dec 69,
Du Pond de Nemours (E.I.) and Co., Aiken, S.C. Savannah River Lab.
R. C. Milham, and L. R. Jones. Apr 70, 16p
Contract AT (07-2)-1
See also Progress rept. Jan-Jun 69, DP-1213.

Descriptors: (*Iodine isotopes, *Adsorption), (*Activated carbon, *Adsorbents), (*Air pollution control equipment, *Nuclear reactor accidents), Nuclear reactor coolants, Reliability.

For abstract, see NSA 24 20.
DP-1234 HC$3.00 MF$0.65

REPORT ON THE PROPOSAL OF E. I. DU PONT DE NEMOURS AND COMPANY FOR THE PERMANENT STORAGE OF RADIOACTIVE SEPARATIONS PROCESS WASTES IN BEDROCK ON THE SAVANNAH RIVER PLANT SITE,
Du Pont de Nemours (E. I.) and Co., Aiken, S.C. Savannah River Lab.
Manson Benedict, J. Barry Cooke, Don U. Deere, Robert M. Garrels, and Jack B. Graham. 22 May 70, 57p
Contract AT (07-2)-1

Descriptors: (*Radioactive wastes, *Underground storage), Caves.
Identifiers: *Bedrock project.

For abstract, see NSA 24 20.
DPST-69-444 HC$3.00 MF$0.65

HTGR BASE PROGRAM QUARTERLY PROGRESS REPORT FOR THE PERIOD ENDING MAY 31, 1970.
Gulf General Atomic, Inc., San Diego, Calif.

30 Jun 70, 95p
Contract AT (04-3)-167
See also GA-9944.

Descriptors: (*High temperature gas cooled reactors, *Reactor fuels), (*Fission products, Diffusion), Transport theory, Graphite, Strontium, Nuclear fuel elements, Nuclear fuel cycles, Nuclear reactor engineering, Nuclear fuel reprocessing, Coated fuel particles, Nuclear reactor control, Reviews, Nuclear reactor materials.

For abstract, see NSA 24 20.
GA-10088 HC$3.00 MF$0.65

DEVELOPMENT OF A CONTINUOUS SAMPLER-MONITOR FOR THE LOFT CONTAINMENT ATMOSPHERE,
Idaho Nuclear Corp., Idaho Falls.
R. E. Schindler, R. R. Hammer, D. E. Black, and L. T. Lakey. Jun 70, 69p
Contract AT (10-1)-1230

Descriptors: (*Nuclear reactor containment, Radiation measuring instruments), (*Fission products, Measurement), Contamination, Nuclear reactor safety.

For abstract, see NSA 24 20
IN-1309 HC$3.00 MF$0.65

EXPERIMENTAL INVESTIGATION OF THE REMOVAL OF KRYPTON AND XENON FROM CONTAMINATED GAS STREAMS BY SELECTIVE ABSORPTION IN FLUOROCARBON SOLVENTS: PHASE I COMPLETION REPORT,
Oak Ridge Gaseous Diffusion Plant, Tenn.
M. J. Stephenson, J. R. Merriman, and D. I. Dunthorn. 17 Aug 70, 71p
Contract W-7405-eng-26

Descriptors: (*Air pollution control equipment, *Adsorbents), (*Radioactive contaminents, *Adsorption), (*Dichlorodifluoromethane, Adsorbents), Xenon isotopes, Krypton isotopes, Halohydrocarbons, Decomposition, Pilot plants.

For abstract, see NSA 24 20.
K-1780 HC$3.00 MF$0.65

DESIGN AND FABRICATION OF A THERMAL SCANNER,
Los Alamos Scientific Lab., N. Mex.
For primary bibliographic entry see Field 14B.
For abstract, see NSA 24 20.
LA-4453 HC$3.00 MF$0.65

THORIUM FUEL CYCLE DEVELOPMENT PROGRESS REPORT NO. 11, JUNE 1970.
Oak Ridge National Lab., Tenn.
Aug 70, 24p
Contract W-7405-eng-26

Descriptors: (*High temperature gas cooled reactors, *Nuclear fuel reprocessing), Coated fuel particles, Irradiation.

For abstract, see NSA 24 20.
ORNL-TM-3088 HC$3.00 MF$0.65

THORIUM FUEL CYCLE DEVELOPMENT PROGRESS REPORT NO. 12, JULY 1970.
Oak Ridge National Lab., Tenn.
Aug 70, 14p
Contract W-7405-eng-26
See also Progress rept. no. 11, ORNL-TM-3088.

Descriptors: (*High temperature gas cooled reactors, *Coated fuel particles), (*Nuclear fuel reprocessing, High temperature gas cooled reactors).

For abstract, see NSA 24 20.
ORNL-TM-3112 HC$3.00 MF$0.65

ON THE FLUORINATION OF PROTACTINIUM,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 7E.
For abstract, see NSA 24 20.
ORNL-tr-2350 HC$3.00 MF$0.65

18H. Radioactivity

SPECIMEN DAMAGE CAUSED BY THE BEAM OF THE TRANSMISSION ELECTRON MICROSCOPE, A CORRELATIVE RECONSIDERATION,
Armed Forces Inst of Pathology Washington D C
For primary bibliographic entry see Field 14B.
AD-713 358

THE EFFECT OF NUCLEAR IRRADIATION ON THE PROPERTIES OF ORDERED SOFT MAGNETIC ALLOYS,
Foreign Technology Div Wright-Patterson AFB Ohio
M. A. Artsishevskii, and A. I. Zusman. 20 Aug 70, 6p Rept no. FTD-HT-23-360-70
Edited trans. of Ukrayinskyi Fizychnyi Zhurnal (USSR) v14 n10 p1737-1739 1969, by H. Peck.

Descriptors: (*Radiation damage, *Magnetic alloys), Magnetic properties, Neutron reactions, Iron alloys, Nickel alloys, Fast neutrons, USSR.
Identifiers: Neutron irradiation, Permalloys, Translations.

The effect of neutron irradiation on the magnetic properties of ordered soft magnetic alloys up to a given dosage in a given range was studied. The development of the directed order is the basic reason for the change in the magnetic properties during irradiation with small doses. The influence of the isotropic order on the magnetic properties increases with the growth of the doses. (Author)
AD-713 447 HC$3.00 MF$0.65

CRYSTAL PROPERTIES AS INFLUENCED BY CRYSTALLOGRAPHIC IMPERFECTIONS: HIGH-ENERGY ION IMPLANTATION,
International Business Machines Corp Hopewell Junction N Y East Fishkill Lab
For primary bibliographic entry see Field 20B.
AD-713 671 HC$3.00 MF$0.65

BIOLOGICAL SHIELDING OF MARITIME REACTORS,
National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.
For primary bibliographic entry see Field 18F.
AEC-tr-7097 HC$3.00 MF$0.65

THE GAMMA EMISSION OF RADIOACTIVE FALLOUT,
National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.
Y. A. Izrael, and E. D. Stukin. 1970, 162p SFCSI-AEC (TT-70-50008), TT-70-50008
Trans. of mono. Gamma-Izluchenie Radioaktivnykh Vypadenii, Moscow, 1967 223p, by Ron Hardin.

Descriptors: (*Fallout, Gamma rays), USSR, Translations, Nuclear explosions, Public health, Reviews.

Contents: Production of radioactive fallout; Gama fields of sources simulating fallout-contaminated localities; Gamma fields over contaminated regions.
AEC-tr-7100 HC$3.00 MF$0.65

IODINE RETENTION STUDIES.
Du Pond de Nemours (E.I.) and Co., Aiken, S.C. Savannah River Lab.
For primary bibliographic entry see Field 18G.
For abstract, see NSA 24 20.
DP-1234 HC$3.00 MF$0.65

A NEW DETERMINATION OF THE EMBRITTLEMENT IN STEEL USING SMALL SPECIMENS (APPROXIMATELY 0.2 cc) IN PARTICULAR WITH RESPECT TO IRRADIATION.
Metaalinstituut TNO, Delft (Netherlands).
For primary bibliographic entry see Field 11F.
For abstract, see NSA 24 20.
EURAEC-2139 HC$3.00 MF$0.65

FLIGHT DATA ANALYSIS OF POWER SUBSYSTEM DEGRADATION AT NEAR SYNCHRONOUS ALTITUDE FINAL REPORT.
Philco-ford Corp., Palo Alto, Calif. Western Development Lab. Div.
For primary bibliographic entry see Field 10B.
For abstract, see STAR 08 21.
N70-38190 HC$3.00 MF$0.65

EFFECT OF REACTOR IRRADIATION ON DUCTILE- BRITTLE TRANSITION AND STRESS-STRAIN BEHAVIOR OF TUNGSTEN.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
For primary bibliographic entry see Field 11F.
For abstract, see STAR 08 21.
N70-38376 HC$3.00 MF$0.65

SAFEY-RELATED OCCURRENCES IN NUCLEAR FACILITIES AS REPORTED IN 1967 AND 1968,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 18I.
For abstract, see NSA 24 20.
ORNL-NSIC-69 HC$3.00 MF$0.65

THE SEDAN EVENT.
Reynolds Electrical and Engineering Co., Inc., Mercury, Nev. Radiological Safety Div.
For primary bibliographic entry see Field 18C.
For abstract, see NSA 24 20.
PNE-203-F HC$3.00 MF$0.65

DETERMINATION OF STRESSED AND DEFORMED STATES IN LIGHT METALS UNDER NEUTRON IRRADIATION (Ob Opredelenii Napryazhennogo i Deformirovannogo Sostoyaniya v Legkikh Metallakh pri Obluchenii Neitronami),
National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.
For primary bibliographic entry see Field 20L.
TT-70-57064 HC$3.00 MF$0.65

PRECIPITATION SCAVENGING IN A LARGE-CLOUD DIFFUSION CODE,
California Univ., Livermore. Lawrence Radiation Lab.
K. R. Peterson, and T. V. Crawford. 28 Jul 70, 16p CONF-700601-1
Presented at the Precipitation Scavenging Meeting, Richland, Wash. 2-4 Jun 70.

Descriptors: (*Nuclear excavation, Cratering), (*Fallout, Scavenging), (*Nuclear clouds, Atmospheric diffusion), Mathematical models, Precipitation (Meteorology), Nuclear explosions.
Identifiers: Cabriolet shot.

For abstract, see NSA 24 20.
UCRL-72603 HC$3.00 MF$0.65

18I. Reactor Engineering and Operation

ANALOG SIMULATION IN NUCLEAR POWER ENGINEERING,
Naval Intelligence Command Alexandria Va Translation Div
I. I. Sidorova. 8 Oct 70, 100p Rept no. NIC-Trans-3123
Trans. of mono. Analogovoe Modelirovanie v Yadernoi Energetike, Moscow, 1969 p5-51, 102-109, 126-158.

Descriptors: (*Nuclear power plants, Reactor operation), Simulation, Analog computers, Mathematical models, Neutron transport theory, Reliability, USSR.
Identifiers: Translations, Analog simulation.

The book discusses the primary areas of nuclear power engineering where simulation methods are used, briefly presents the principles for the mathematical simulation of the basic problems, and cites the block diagrams and schematics of models used for calculations, experimental work, and operation of nuclear power plants. The book is intended to familiarize engineers, scientists, and students working in the nuclear power engineering field with the capabilities of simulation methods that are applicable to nuclear power plants. (Author)
AD-713 273 HC$3.00 MF$0.65

HEAT EXCHANGERS IN NUCLEAR POWER PLANTS,
Naval Intelligence Command Alexandria Va Translation Div
P. A. Andreev, D. I. Gremilov, and E. D. Fedorovich. 2 Sep 70, 76p Rept no. NIC-Trans-3110
Trans. of mono. Teploobmennye Apparaty Yadernykh Energeticheskikh Ustanovok, Leningrad, 1969 p46-69, 99-134.

Descriptors: (*Heat exchangers, *Nuclear power plants), Heat transfer, Graphite moderated reactors, USSR, Boiling water reactors, Reactor coolants, Design, Boilers.
Identifiers: Translations.

The development of vertical steam generators with a group of heating tubes located in a water-filled space began with the creation of the steam generators for the first nuclear power plant in the USSR, commissioned in 1954. Further development of this type of steam generator was accomplished successfully in the USSR and abroad. Today, steam generators are being built that have a per unit rating up to 250 MW (electrical rating). The report discusses the major development stages of this type of steam generator and the performance characteristics that were achieved. (Author)
AD-713 423 HC$3.00 MF$0.65

BIOLOGICAL SHIELDING OF MARITIME REACTORS,
National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.
For primary bibliographic entry see Field 18F.
AEC-tr-7097 HC$3.00 MF$0.65

PRELIMINARY SYSTEM DESIGN DESCRIPTION OF THE EBR-II IN-CORE INSTRUMENT TEST FACILITY. EBR-II PROJECT,
Argonne National Lab., Ill.
E. Hutter, and O. Seim. Jun 70, 58p
Contract W-31-109-eng-38

Descriptors: (*Breeder reactors, Reactor cores), (*Reactor cores, Design criteria), Neutron flux, Nuclear reactor control elements, Nuclear reactor safety.
Identifiers: Experimental breeder reactor 2.

For abstract, see NSA 24 20.
ANL-EBR-23 HC$3.00 MF$0.65

PRELIMINARY SYSTEM DESIGN DESCRIPTION OF THE EBR-II FAILED-FUEL TRANSFER SYSTEM. EBR-II PROJECT,
Argonne National Lab., Ill.
C. J. Divona, and E. Hutter. Jul 70, 27p
Contract W-31-109-eng-38

Descriptors: (*Breeder reactors, Nuclear fuel elements), (*Nuclear fuel elements, Materials handling), Nuclear reactor engineering, Performance.
Identifiers: Failed fuel transfer systems, Experimental breeder reactor 2.

For abstract, see NSA 24 20.
ANL-EBR-24 HC$3.00 MF$0.65

SODIUM TECHNOLOGY QUARTERLY REPORT, JANUARY-MARCH 1970,
Argonne National Lab., Ill.
For primary bibliographic entry see Field 11F.
For abstract, see NSA 24 20.
ANL/ST-2 HC$3.00 MF$0.65

REACTOR DEVELOPMENT PROGRAM PROGRESS REPORT, JUNE 1970.
Argonne National Lab., Ill.

31 Jul 70, 196p
Contract W-31-109-eng-38

Descriptors: (*Breeder reactors, Operations), Fast reactors (Nuclear), Nuclear reactor kinetics, Critical assemblies, Nuclear fuels, Nuclear reactor control.
Identifiers: Liquid metal fast breeder reactors, Experimental breeder reactor 2.

For abstract, see NSA 24 20.
ANL-7705 HC$3.00 MF$0.65

STUDIES OF MATERIAL WASTAGE RESULTING FROM REACTIONS OF WATER IN SODIUM,
Atomic Power Development Associates, Inc., Detroit, Mich.
For primary bibliographic entry see Field 13A.
For abstract, see NSA 24 20.
APDA-254 HC$3.00 MF$0.65

QUARTERLY TECHNICAL PROGRESS REPORT ON AEC-SPONSORED ACTIVITIES. JANUARY-MARCH 1970.
Atomic Power Development Associates, Inc., Detroit, Mich.

1970, 47P
Contract AT (11-1)-865

Descriptors: (*Fast reactors (Nuclear), Nuclear reactor engineering), (*Nuclear reactor coolants, Sodium), Nuclear reactor reactivity.
Identifiers: Liquid metal fast breeder reactors.

For abstract, see NSA 24 20.
APDA-261 HC$3.00 MF$0.65

AN EVALUATION OF THE APPLICABILITY OF EXISTING DATA TO THE ANALYTICAL DESCRIPTION OF A NUCLEAR-REACTOR ACCIDENT.
Quarterly progress rept. for Apr-Jun 70,
Battelle Memorial Inst., Columbus, Ohio.
Wayne A. Carbiener, and Robert L. Ritzman. Jul 70, 52p
Contract W-7405-eng-92

Descriptors: (*Nuclear reactor safety, Nuclear reactor accidents), (*Nuclear reactor coolants, Leakage), Fission products, Nuclear reactor containment, Iodine, Pressure vessels, Nuclear reactor kinetics, Heat transfer, Cooling systems, Boiling water reactors, Pressurized water reactors.
Identifiers: Loss of coolant accidents.

For abstract, see NSA 24 20.
BMI-1885 HC$3.00 MF$0.65

INVESTIGATION OF THE INITIATION AND EXTENT OF DUCTILE PIPE RUPTURE, PHASE II.
Progress rept. Apr-Jun 70,
Battelle Memorial Inst., Columbus, Ohio.
Robert J. Eiber, Willard A. Maxey, Arthur R. Duffy, and Thomas J. Atterbury. Jul 70, 4p
Contract W-7405-eng-92

Descriptors: (*Pipes (Tubes), Water cooled reactors), Creep rupture strength, Crack propragation.

For abstract, see NSA 24 20.
BMI-1887 HC$3.00 MF$0.65

INTERMEDIATE HEAT EXCHANGER MODELING FOR FFTF SIMULATION,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
A. L. Gunby. 15 Sep 69, 29p CONF-690959-1
Contract AT (45-1)-1830
Presented at the Meeting on Techniques in Simulation, Richland, Wash. Sep 69.

Descriptors: (*Fast reactors (Nuclear), Heat exchangers), Cooling systems, Nuclear reactor coolants, Nuclear research and test reactors, Simulation, Model tests, Heat transfer.
Identifiers: Fast flux test facility.

For abstract, see NSA 24 20.
BNWL-SA-2818 HC$3.00 MF$0.65

FFTF FUEL PIN AND SUBASSEMBLY CONCEPTUAL DESIGN METHODS AND DATA,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
E. G. Stevens, P. D. Cohn, R. J. Jackson, D. C. Kolesar, and C. L. Mohr. Jun 70, 186p
Contract AT (45-1)-1830

Descriptors: (*Fast reactors (Nuclear), Nuclear fuel pins), (*Nuclear fuel pins, Design), Thermal stresses, Nuclear fuel claddings, Heat transfer, Performance tests, Nuclear reactor accidents, Erosion, Nuclear reactor engineering, Nuclear fuels.
Identifiers: Fast flux test facility.

For abstract, see NSA 24 20.
BNWL-1064 HC$3.00 MF$0.65

FFTF CLOSED LOOP TEST CHARACTERISTICS,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
R. E. Keyes. Jun 70, 58p
Contract AT (45-1)-1830

Descriptors: (*Fast reactors (Nuclear), Nuclear reactor coolants), Breeder reactors, Nuclear fuels, Heat transfer, Cooling systems, Nuclear reactor engineering.

For abstract, see NSA 24 20.
BNWL-1251 HC$3.00 MF$0.65

CREEP ANALYSIS OF STATICALLY INDETERMINATE BEAMS,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
For primary bibliographic entry see Field 20K.
For abstract, see NSA 24 20.
BNWL-1362 HC$3.00 MF$0.65

PROPOSAL TO IRRADIATED UNENCAPSULATED INSTRUMENTED FUEL PINS IN THE EBR-II SUBASSEMBLY PNL-17,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
For primary bibliographic entry see Field 18J.
For abstract, see NSA 24 20.
BNWL-1420 HC$3.00 MF$0.65

COUNTERMEASURES AGAINST VIBRATION AND OSCILLATIONS OF SHIP REACTORS,
Division of Technical Information Extension (AEC), Oak Ridge, Tenn.
For primary bibliographic entry see Field 13J.
For abstract, see NSA 24 20.
CONF-700211-5 HC$3.00 MF$0.65

THE DEVELOPMENT IN FRANCE OF COMPONENTS OF SODIUM CIRCUITS FOR SODIUM-COOLED FAST REACTORS, AND FUTURE PERSPECTIVES,
Commissariat a l'Energie Atomique, Cadarche (France). Centre d'Etudes Nucleaires.
R. Pontier, E. Benoist, J. Delisle, P. Marmonier, and J. P. Crette. 1970, 26p SM-130/30
Prepared in cooperation with Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires. Presented at the Symposium on Progress in Sodium-Cooled Fast Reactor Engineering, (Monaco).

Descriptors: (*Nuclear reactor coolants, Sodium), Liquid metal cooled reactors, Fast reactors (Nuclear), Cooling systems, Nuclear reactor engineering, France, Design.
Identifiers: Cadarache reactors (Rapsodie), Phenix fast reactor.

For abstract, see NSA 24 20.
CONF-700307-5 HC$3.00 MF$0.65

ANALYSIS OF CRITICAL REGIONS OF LACBWR. MAIN CIRCULATION AND FEEDWATER PIPING. BOOK 1 OF 3. SUMMARY.
Technical rept.
Teledyne Materials Research Co., Waltham, Mass.

26 Mar 70, 11p E-1236 (a)
Contract AT (11-1)-850
Prepared in cooperation with Allis-Chalmers, Bethesda, Md. Atomic Energy Div. See also DOCKET-1155-62 (Book 2).

Descriptors: (*Boiling water reactors, Nuclear reactor coolants), Feedwater, Cooling systems, Nozzles, Thermal stresses, Pipe bends, Heat transfer, Nuclear reactor engineering, Power reactors (Nuclear).
Identifiers: LaCrosse boiling water reactor.

For abstract, see NSA 24 20.
DOCKET-1155-61 HC$3.00 MF$0.65

STRESS CONCENTRATIONS AROUND UNREINFORCED CIRCULAR HOLES IN A PLATE UNDER UNIDIRECTIONAL STRESS. PROJECT DRAGON,
Atomic Energy Establishment, Winfrith (England).
For primary bibliographic entry see Field 20K.
For abstract, see NSA 24 20.
DP-Report-344 HC$3.00 MF$0.65

MEASUREMENTS OF CONTROL ROD WORTH AND EXCESS REACTIVITY ON THE FIRST CORE OF DRAGON. PROJECT DRAGON,
Atomic Energy Establishment, Winfrith (England).
I. R. Cameron, V. E. Della Loggia, A. D. Hammond, and J. C. Stillwell. Jul 65, 50p

Descriptors: (*High temperature gas cooled reactors, Control rods), (*Nuclear reactor reactivity, Measurement), Nuclear reactor reactivity, Nuclear reactor control, Nuclear reactor engineering, Performance tests, Reactor cores, Great Britain.
Identifiers: Dragon project.

For abstract, see NSA 24 20.
DP-Report-359 HC$3.00 MF$0.65

PROPOSALS FOR THE PERIODIC INSPECTION OF THE PRESSURE CONTAINMENT SYSTEM AND ASSOCIATED PLANT AND EQUIPMENT OF THE DRAGON REACTOR. PROJECT DRAGON,
Atomic Energy Establishment, Winfrith (England).
J. F. G. Conde. Aug 65, 114p

Descriptors: (*High temperature gas cooled reactors, Maintenance), Inspection, Nuclear reactor containment, Pressure vessels, Corrosion, Radiation damage, Nuclear reactor engineering, Nuclear reactor materials, Power reactors (Nuclear), Nuclear reactor safety, Leakage, Thermal stresses, Irradiation, Reactor cores, Great Britain.
Identifiers: Dragon project.

For abstract, see NSA 24 20.
DP-Report-367 HC$3.00 MF$0.65

CARBON TRANSPORT IN A HTGCR POWER PLANT. PROJECT DRAGON,
Atomic Energy Establishment, Winfrith (England).
L. Valette. Oct 65, 32p

Descriptors: (*High temperature gas cooled reactors, Leakage), (*Carbon, Deposition), Circuits, Impurities, Mathematical models, Graphite, Great Britain.
Identifiers: Dragon project.

For abstract, see NSA 24 20.
DP-Report-383 HC$3.00 MF$0.65

POST IRRADIATION RADIOCHEMICAL ANALYSIS OF CHARGE 8 FOR PLUTO LOOP A. PROJECT DRAGON,
Atomic Energy Research Establishment, Harwell (England).
P. E. Brown, and H. J. Nordwall. Oct 65, 51p
AERE-R-5040

Descriptors: (*High temperature gas cooled reactors, Cooling), Radioactive contaminants, Fission products, Great Britain.
Identifiers: Dragon project.

For abstract, see NSA 24 20.
DP-Report-388 HC$3.00 MF$0.65

EXPERIMENTS ON PRECONCENTRATION OF IMPURITIES IN HELIUM GAS BY THERMAL DIFFUSION AND THE MEASURING OF THERMAL DIFFUSION FACTORS. PROJECT DRAGON,
Atomic Energy Establishment, Winfrith (England).
C. A. Velds, H. W. Grotendorst, J. Los, and A. E. De Vries. Jan 66, 14p CONF-660318-4
Presented at the Dragon Contractors' Research and Development Symposium, Harwell (England).

Descriptors: (*High temperature gas cooled reactors, Helium), (*Gas flow, Impurities), Thermal diffusion, Carbon dioxide, Carbon monoxide, Methane, Great Britain.
Identifiers: Dragon project, Thermal diffusion separation.

For abstract, see NSA 24 20.
DP-Report-392 HC$3.00 MF$0.65

REPORT ON WORK AT A.E.R.E. FOR THE DRAGON PROJECT, APRIL-OCTOBER 1965. PROJECT DRAGON.
Atomic Energy Research Establishment, Harwell (England).

Dec 65, 9p AERE-PR/D9

Descriptors: (*High temperature gas cooled reactors, Nuclear reactor engineering), (*Coated fuel particles, Irradiation), Coatings, Performance tests, Thermal stresses, Radiation damage, Metallurgy, Thorium, Nuclear reactor control, Power reactors (Nuclear), Uranium, Great Britain, Nuclear fuels, Nuclear reactor materials.
Identifiers: Dragon project.

For abstract, see NSA 24 20.
DP-Report-397 HC$3.00 MF$0.65

THE BEHAVIOR OF UO2 AEROSOLS IN CLOSED SYSTEMS,
Division of Technical Information Extension (AEC), Oak Ridge, Tenn.
W. Schikarski, and H. Wild. Dec 69, 71p
Trans. of Kernforschungszentrum, Karlsruhe. Institut fuer Angewandte Reaktorphysik. Report (West Germany) KFK-1032.

Descriptors: (*Fast reactors (Nuclear), Nuclear fuel elements), (*Uranium oxides, Transport properties), (*Nuclear reactor accidents, Aerosols), Safety engineering, Inert atmospheres, Diffusion coefficient, Translations, West Germany.
Identifiers: Euratom fast reactor exchange program.

For abstract, see NSA 24 20.
EURFNR-738 HC$3.00 MF$0.65

METHOD FOR THE EXPERIMENTAL INVESTIGATION OF FLOW-INDUCED FUEL ROD OSCILLATIONS,
Division of Technical Information Extension (AEC), Oak Ridge, Tenn.
J. Kadlec, and K. D. Appelt. Nov 69, 65p

Trans. of Kernforschungszentrum, Karlsruhe. Report (West Germany) KFK-1082.

Descriptors: (*Nuclear fuel rods, Oscillations), Fluid flow, Cooling systems, Nuclear reactor coolants, Performance tests, Translations, West Germany, Nuclear reactor engineering.

For abstract, see NSA 24 20.
EURFNR-745 HC$3.00 MF$0.65

SODIUM-AIR REACTION AS A REACTOR FAULT CONDITION,
Division of Technical Information Extension (AEC), Oak Ridge, Tenn.
For primary bibliographic entry see Field 7B.
For abstract, see NSA 24 20.
EURFNR-754 HC$3.00 MF$0.65

SUMMARY OF CORE SUPPORT GRAPHITE AND CARBON RESEARCH AND DEVELOPMENT TEST PROGRAMS FOR THE FORT ST. VRAIN REACTOR PLANT,
Gulf General Atomic, Inc., San Diego, Calif.
R. K. Luci. 15 Jun 70, 113p
Contract AT (04-3)-633

Descriptors: (*Gas cooled reactors, Graphite moderated reactors), Reactor cores, Reflectors, Nuclear reactor engineering, Power reactors (Nuclear), Performance tests.
Identifiers: Fort St. Vrain power reactor.

For abstract, see NSA 24 20.
GA-9641 HC$3.00 MF$0.65

SOUTHWEST EXPERIMENTAL FAST OXIDE REACTOR DEVELOPMENT PROGRAM.
General Electric Co., Sunnyvale, Calif. Breeder Reactor Development Operation.
For primary bibliographic entry see Field 18J.
For abstract, see NSA 24 20.
GEAP-10010-24 HC$3.00 MF$0.65

SODIUM-COOLED REACTORS FAST CERAMIC REACTOR DEVELOPMENT PROGRAM.
Quarterly rept. no. 33, Nov 69-Jan 70.
General Electric Co., Sunnyvale, Calif. Breeder Reactor Development Operation.

Feb 70, 128p
Contract AT (04-3)-189

Descriptors: (*Fast reactors (Nuclear), Ceramic nuclear fuels), (*Nuclear reactor coolants, Sodium), Nuclear reactor engineering, Nuclear fuels, Nuclear reactor safety, Reviews, Fission products, Reactor cores, Nuclear reactor kinetics, Nuclear fuel cladding, Nuclear fuel cycles.

For abstract, see NSA 24 20.
GEAP-10028-33 HC$3.00 MF$0.65

DESIGN AND ANALYSIS OF SEFOR CORE I,
General Electric Co., Sunnyvale, Calif. Breeder Reactor Development Operation.
R. A. Meyer, A. B. Reynolds, S. L. Stewart, M. L. Johnson, and E. R. Craig. Jun 70, 286p
Contract AT (04-3)-540
Errata sheet inserted.

Descriptors: (*Breeder reactors, Nuclear reactor engineering), (*Reactor cores, Design), Nuclear reactor control, Nuclear fuels, Nuclear research and test reactors, Cooling systems, Fluid flow.
Identifiers: Southwest experimental fast oxide reactor.

For abstract, see NSA 24 20.
GEAP-13598 HC$3.00 MF$0.65

INTERNATIONAL ATOMIC ENERGY AGENCY, INTERNATIONAL WORKING GROUP ON FAST REACTORS MEETING OF SPECIALISTS ON SODIUM-WATER REACTIONS, ARGONNE, USA, 5-6 NOVEMBER 1968.
Argonne National Lab., Ill.
For primary bibliographic entry see Field 18J.
For abstract, see NSA 24 20.
IAEA/NPR-9 HC$3.00 MF$0.65

RELAPS: A COMPUTER PROGRAM FOR REACTOR BLOWDOWN ANALYSIS,
Idaho Nuclear Corp., Idaho Falls.
W. H. Rettig, G. A. Jayne, K. V. Moore, C. E. Slater, and M. L. Uptmor. Jun 70, 123p
Contract AT (10-1)-1230

Descriptors: (*Pressurized water reactors, *Nuclear reactor accidents), (*Nuclear reactor coolants, Leakage), Computer programming, Cooling systems, Nuclear reactor engineering.
Identifiers: Blowdown tests, RELAPS computer program.

For abstract, see NSA 24 20.
IN-1321 HC$3.00 MF$0.65

SEMISCALE BLOWDOWN AND EMERGENCY CORE COOLING (ECC) PROJECT,
Idaho Nuclear Corp., Idaho Falls.
J. C. Haire, and G. F. Brockett. Jul 70, 43p
Contract AT (10-1)-1230

Descriptors: (*Water cooled reactors, *Nuclear reactor accidents), (*Nuclear reactor coolants, Leakage), Cooling systems, Thermal stresses, Reactor cores, Nuclear reactor engineering, Water cooled reactors, Pressure vessels, Simulation, Power reactors (Nuclear).
Identifiers: Blowdown tests.

For abstract, see NSA 24 20.
IN-1384 HC$3.00 MF$0.65

A CORRELATION OF ROD BUNDLE CRITICAL HEAT FLUX FOR WATER IN THE PRESSURE RANGE 150 TO 725 PSIA,
Idaho Nuclear Corp., Idaho Falls.
E. Daniel Hughes. Jul 70, 75p
Contract AT (10-1)-1230

Descriptors: (*Nuclear fuel rods, Thermal stresses), Nuclear reactor engineering, Nuclear reactor coolants, Curve fitting, Reactor cores, Nuclear reactor accidents.

For abstract, see NSA 24 20.
IN-1412 HC$3.00 MF$0.65

MOISTURE SEPARATOR DEVELOPMENT.
MSA Research Corp., Evans City, Pa.
For primary bibliographic entry see Field 13I.
For abstract, see NSA 24 20.
MSAR-69-151 HC$3.00 MF$0.65

MOISTURE SEPARATOR DEVELOPMENT.
MSA Research Corp., Evans City, Pa.
For primary bibliographic entry see Field 13I.
For abstract, see NSA 24 20.
MSAR-69-192 HC$3.00 MF$0.65

MOISTURE SEPARATOR DEVELOPMENT.
MSA Research Corp., Evans City, Pa.
For primary bibliographic entry see Field 13I.
For abstract, see NSA 24 20.
MSAR-70-17 HC$3.00 MF$0.65

MOISTURE SEPARATOR DEVELOPMENT PROGRAM.
MSA Research Corp., Evans City, Pa.
For primary bibliographic entry see Field 13I.
For abstract, see NSA 24 20.
MSAR-70-79 HC$3.00 MF$0.65

DEVELOPMENT TENDENCIES IN CONSTRUCTION OF LARGE PRESSURE VESSELS FOR NUCLEAR REACTORS.
Entwicklungstendenzen Im Bau Grosser Druckbehaelter Fuer Kernreaktoren
Osterreichische Studiengesellschaft Fur Atomenergie G.M.B.H., Seibersdorf (Austria). Inst. Fuer Reaktortechnik.
K. Schlosser. Apr 70, 20p SGAE-RT-30/1970
Lang- in German Subm- Submitted for Publication

Descriptors: *Nuclear reactors, *Pressure vessels, Construction, Production engineering, Steels, Structural design.

For abstract, see STAR 08 21.
N70-38579 HC$3.00 MF$0.65

RADIATIVE ENERGY TRANSPORT IN A PLASMA REACTOR.
Strahlungstransport in Einem Plasma-reaktor
Deutsche Forschungs- Und Versuchsanstalt Fuer Luft- Und Raumfahrt, Stuttgart (West Germany). Inst. Fuer Energiewandlung Und Elektrische Antriebe.
S. Kelm. May 70, 56p DLR-FB-70-18
Lang- in German, English Summary

Descriptors: *Gaseous fission reactors, *High temperature plasmas, *Radiative heat transfer, *Thermal radiation, *Uranium, Energy conversion, Plasma propulsion, Radiant flux density, Temperature distribution, Thermal resistance.

For abstract, see STAR 08 21.
N70-38678 HC$3.00 MF$0.65

THE SITING OF NUCLEAR REACTORS AS RELATED TO URBAN HEAT SUPPLY,
Oak Ridge National Lab., Tenn.
H. B. Piper, and G. L. West, Jr. Aug 70, 26p
Contract W-7405-eng-26

Descriptors: (*Nuclear reactor safety, Site surveys), (*Heating equipment, Urban areas), Population (Statistics), Air pollution, Contamination, Nuclear reactor engineering, Economic factors, Public health.

For abstract, see NSA 24 20.
ORNL-HUD-11 HC$3.00 MF$0.65

EARTHQUAKES AND NUCLEAR POWER PLANT DESIGN,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 18E.
For abstract, see NSA 24 20.
ORNL-NSIC-28 HC$3.00 MF$0.65

SAFEY-RELATED OCCURRENCES IN NUCLEAR FACILITIES AS REPORTED IN 1967 AND 1968,
Oak Ridge National Lab., Tenn.
E. N. Cramer, and W. R. Casto. Jul 70, 116p
Contract W-7405-eng-26

Descriptors: (*Nuclear reactor safety, Bibliographies), Nuclear reactor accidents, Ecology, Public health, Nuclear reactor control, Aerospace engineering, Fission products, Nuclear reactor containment.

For abstract, see NSA 24 20.
ORNL-NSIC-69 HC$3.00 MF$0.65

COMPILATION OF UNITED STATES NUCLEAR STANDARDS. 6TH EDITION, 1969.
Oak Ridge National Lab., Tenn.
Jul 70, 177p*
Contract W-7405-eng-26

Descriptors: (*Nuclear energy, Bibliographies), (*Nuclear reactor engineering, Bibliographies), Standards, Nuclear reactor control, Nuclear reac-

tor safety, Radioactive isotopes, Radiation measuring instruments, Ecology.

For abstract, see NSA 24 20.
ORNL-NSIC-76 HC$3.00 MF$0.65

COMPUTER HANDLING OF REACTOR DATA FOR SAFETY: CHORD-S,
Oak Ridge National Lab., Tenn.
T. E. Cole, and F. A. Heddleson. Aug 70, 23p
Contract W-7405-eng-26

Descriptors: (*Nuclear reactor safety, Data processing), Power reactors (Nuclear), Design, Information retrieval.
Identifiers: CHORD S project.

For abstract, see NSA 24 20.
ORNL-TM-2928 HC$3.00 MF$0.65

QUALITY-ASSURANCE PRACTICES IN CONSTRUCTION AND MAINTENANCE OF THE MOLTEN-SALT REACTOR EXPERIMENT,
Oak Ridge National Lab., Tenn.
B. H. Webster. Apr 70, 106p

Descriptors: (*Molten salt nuclear reactors, Maintenance), Nuclear reactor engineering, Power reactors (Nuclear), Fused salts, Performance tests, Nuclear reactor safety.

For abstract, see NSA 24 20.
ORNL-TM-2999 HC$3.00 MF$0.65

PHASE REPORT NO. 115-1 ON STRESS INDICES FOR SMALL BRANCH CONNECTIONS WITH EXTERNAL LOADINGS,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 13K.
For abstract, see NSA 24 20.
ORNL-TM-3014 HC$3.00 MF$0.65

TWO-FLUID MOLTEN-SALT BREEDER REACTOR DESIGN STUDY (STATUS AS OF JANUARY 1, 1968),
Oak Ridge National Lab., Tenn.
R. C. Robertson, R. B. Briggs, O. L. Smith, and E. S. Bettis. Aug 70, 80p
Contract W-7405-eng-26

Descriptors: (*Molten salt nuclear reactors, Design), Cooling systems, Nuclear reactor engineering, Nuclear reactor materials, Graphite, Nuclear reactor containment, Turbogenerators, Nuclear fuels, Thermal reactors, Thorium, Fission products, Moderators, Breeder reactors, Power reactors (Nuclear).

For abstract, see NSA 24 20.
ORNL-4528 HC$3.00 MF$0.65

COMPARISON OF USAS B31.7 PLASTIC FATIGUE ANALYSIS WITH TEST DATA ON PIPING COMPONENTS.
Phase rept. no. 115-2,
Battelle Memorial Inst., Columbus, Ohio.
E. C. Rodabaugh. Feb 69, 24p
Prepared in Cooperation with Oak Ridge National Lab., Tenn.

Descriptors: (*Nuclear reactor engineering, Pressure vessels), (*Piping systems, Fatigue tests), Fatigue strength at N cycles, Stress analysis, Loads (Forces), Design criteria.

For abstract, see NSA 24 20.
TID-25479 HC$3.00 MF$0.65

ECCS VARIABLE FLOODING RATE SIMULATION PWR FLECHT TEST RESULTS,
Westinghouse Electric Corp., Pittsburgh, Pa. Atomic Power Dept.
F. F. Cadek, D. P. Dominicis, R. H. Leyse, and J. O. Cermak. 1970, 5p
Contract AT (10-1)-1230

Descriptors: (*Pressurized water reactors, Flooding), (*Nuclear reactor accidents, Nuclear reactor coolants), Nuclear fuel rods, Heat transfer.

For abstract, see NSA 24 20.
WCAP-5352 HC$3.00 MF$0.65

EFFECT PF 75 PERCENT TO 100 PERCENT FLOW BLOCKAGE ON BOTTOM COOLING HEAT TRANSFER EFFECTIVENESS,
Westinghouse Electric Corp., Pittsburgh, Pa.
D. P. Dominicis, F. F. Cadek, R. H. Leyse, and J. O. Cermak. 1970, 5p

Descriptors: (*Nuclear reactor coolants, Heat transfer), Cooling systems, Nuclear reactor engineering, Fluid flow, Control rods, Nuclear fuel rods, Reactor cores, Thermal stresses.

For abstract, see NSA 24 20.
WCAP-5353 HC$3.00 MF$0.65

18J. Reactor Materials

THE METALLURGY OF PLUTONIUM,
National Science Foundation, Washington, D.C.
Special Currency Science Information Program.
For primary bibliographic entry see Field 11F.
AEC-tr-7095 HC$3.00 MF$0.65

REACTOR DEVELOPMENT PROGRAM PROGRESS REPORT, JUNE 1970.
Argonne National Lab., Ill.
For primary bibliographic entry see Field 18I.
For abstract, see NSA 24 20.
ANL-7705 HC$3.00 MF$0.65

PROJECT SUMMARY, SODIUM-WATER REACTIONS RELATED TO LMFBR STEAM GENERATORS,
Atomic Power Development Associates, Inc., Detroit, Mich.
H. V. Chamberlain. Jun 70, 63p
Contract AT (11-1)-865

Descriptors: (*Sodium, Chemical reactions), (*Liquid metal cooled reactors, Leakage), Breeder reactors, Fast reactors.

For abstract, see NSA 24 20.
APDA-257 HC$3.00 MF$0.65

QUARTERLY TECHNICAL PROGRESS REPORT ON AEC-SPONSORED ACTIVITIES. JANUARY-MARCH 1970.
Atomic Power Development Associates, Inc., Detroit, Mich.
For primary bibliographic entry see Field 18I.
For abstract, see NSA 24 20.
APDA-261 HC$3.00 MF$0.65

PLUTONIUM LATTICE EXPERIMENT IN UNIFORM TEST LATTICE OF UO2-1.5 PERCENT PuO2 FUEL,
Babcock and Wilcox Co., Lynchburg, Va. Research and Development Div.
G. T. Fairburn, W. G. Pettus, and N. L. Snidow. Aug 70, 38p
Contract AT (45-1)-1830

Descriptors: (*Water moderated reactors, Oxide nuclear fuels), (*Reactor cores, Design), (*Plutonium oxides, Safety), Nuclear reactor engineering, Uranium oxides, Nuclear reactor reactivity.

For abstract, see NSA 24 20.
BAW-1357 HC$3.00 MF$0.65

PROPOSAL TO IRRADIATE UNENCAPSULATED PINS IN THE EBR-II SUBASSEMBLIES PNL-6, PNL-7, AND PNL-8,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
E. O. Ballard, and L. A. Pember. Jun 70, 257p
Contract AT (45-1)-1830

Descriptors: (*Breeder reactors, Nuclear fuel pins), (*Nuclear fuel pins, Irradiation), Nuclear fuels, Radiation damage, Metallurgy, Tests, Thermal stresses, Nuclear fuel claddings, Criticality.
Identifiers: Experimental breeder reactor 2.

For abstract, see NSA 24 20.
BNWL-1103 HC$3.00 MF$0.65

THERMAL AND HYDRAULIC ANALYSIS OF A PHOENIX FUEL IN THE MATERIALS TEST REACTOR,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
R. M. Hiatt. Jun 70, 93p
Contract AT (45-1)-1830

Descriptors: (*Nuclear fuels, Performance tests), Thermal stresses, Plutonium alloys, Hydraulic test units, Irradiation, Water moderated reactors.

For abstract, see NSA 24 20.
BNWL-1409 HC$3.00 MF$0.65

PROPOSAL TO IRRADIATED UNENCAPSULATED INSTRUMENTED FUEL PINS IN THE EBR-II SUBASSEMBLY PNL-17,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
E. O. Ballard, and M. K. Millhollen. Jun 70, 256p
Contract AT (45-1)-1830

Descriptors: (*Breeder reactors, Nuclear fuel pins), (*Nuclear fuel pins, Irradiation), Nuclear reactor coolants, Nuclear reactor engineering, Nuclear fuels, Cooling systems, Fabrication, Nuclear fuel claddings, Performance tests.
Identifiers: Experimental breeder reactor 2.

For abstract, see NSA 24 20.
BNWL-1420 HC$3.00 MF$0.65

CERAMIC FUELS FOR HEAVY WATER REACTORS,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
R. J. Anicetti. Jun 70, 81p
Contract AT (45-1)-1830

Descriptors: (*Ceramic nuclear fuels, Heavy water reactors), Reactor cores, Reactor fuels, Nuclear reactor engineering, Fabrication, Performance tests, Nuclear fuel claddings, Quality control, Design, Nondestructive tests.

For abstract, see NSA 24 20.
BNWL-1435 HC$3.00 MF$0.65

PLUTONIUM UTILIZATION PROGRAM.
Technical activities quarterly rept. Mar-May 70.
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
Jun 70, 103p
Contract AT (45-1)-1830
See also BNWL-1358.

Descriptors: (*Plutonium isotopes, *Nuclear fuels), Critical assemblies, Nuclear reactor reactivity, Neutron flux, Least squares method, Data processing.

For abstract, see NSA 24 20.
BNWL-1442 HC$3.00 MF$0.65

THE DEVELOPMENT IN FRANCE OF COMPONENTS OF SODIUM CIRCUITS FOR SODI-

UM-COOLED FAST REACTORS, AND FUTURE PERSPECTIVES,
Commissariat a l'Energie Atomique, Cadarche (France). Centre d'Etudes Nucleaires.
For primary bibliographic entry see Field 18I.
For abstract, see NSA 24 20.
CONF-700307-5 HC$3.00 MF$0.65

WEST VALLEY REPROCESSING PLANT. REDUCTION IN STRONTIUM AND CESIUM DISCHARGED TO SURFACE WATERS.
Nuclear Fuel Services, Inc., West Valley, N.Y.
14 Aug 70, 2p

Descriptors: (*Nuclear fuel reprocessing, Health physics), New York.
Identifiers: West Valley processing plant.

For abstract, see NSA 24 20.
DOCKET-50201-41 HC$3.00 MF$0.65

BARNWELL NUCLEAR FUEL PLANT.
Preliminary safety analysis rept., Amendment 5.
Allied-Gulf Nuclear Services, Florham Park, N.J.

13 Aug 70, 102p

Descriptors: (*Nuclear fuel reprocessing, Safety), South Carolina.
Identifiers: Barnwell nuclear fuel processing plant.

For abstract, see NSA 24 20.
DOCKET-50332-15 HC$3.00 MF$0.65

THE RETENTION OF FISSION PRODUCTS IN DISPERSED FUELS. PROJECT DRAGON,
Atomic Energy Establishment, Winfrith (England).
For primary bibliographic entry see Field 18G.
For abstract, see NSA 24 20.
DP-Report-308 HC$3.00 MF$0.65

BASIC STUDIES ON THE STRUCTURE OF PYROLYTIC CARBON. PROJECT DRAGON,
Atomic Energy Establishment, Winfrith (England).
B. Chinaglia, G. Cocito, M. Domenici, F. Pieragostini, and H. Walther. Feb 65, 64p

Descriptors: (*High temperature gas cooled reactors, *Coated fuel particles), (*Pyrolytic graphite, Coated fuel particles), Surfaces, Porosity, Great Britain.
Identifiers: Dragon project.

For abstract, see NSA 24 20.
DP-Report-322 HC$3.00 MF$0.65

PROPOSALS FOR THE PERIODIC INSPECTION OF THE PRESSURE CONTAINMENT SYSTEM AND ASSOCIATED PLANT AND EQUIPMENT OF THE DRAGON REACTOR. PROJECT DRAGON,
Atomic Energy Establishment, Winfrith (England).
For primary bibliographic entry see Field 18I.
For abstract, see NSA 24 20.
DP-Report-367 HC$3.00 MF$0.65

ANNEALING AS A POST-IRRADIATION TECHNIQUE FOR THE STUDY OF FISSION PRODUCT RELEASE FROM COATED PARTICLE FUELS. PROJECT DRAGON,
Atomic Energy Establishment, Winfrith (England).
P. Barr, G. P. Hauser, and C. Vivante. Sep 65, 34p

Descriptors: (*High temperature gas cooled reactors, *Coated fuel particles), Annealing, Fission products, Great Britain.
Identifiers: Dragon product.

For abstract, see NSA 24 20.
DP-Report-373 HC$3.00 MF$0.65

GRADUATE IRRADIATIONS IN THE SECOND UP-RATED ELEMENT, FIRST CHARGE POSITION 3/5,
Atomic Energy Establishment, Winfrith (England).
Eric Voice. Dec 65, 52p
Report on Project DRAGON.

Descriptors: (*High temperature gas cooled reactors, Neutron flux), (*Graphite, Irradiation), Nuclear fuel elements, Reactor cores, Great Britain.
Identifiers: Dragon project.

For abstract, see NSA 24 20.
DP-Report-382 HC$3.00 MF$0.65

THE STUDY OF IRRADIATED AND IRRADIATED COATED FUEL PARTICLES BY THE X-RAY MICROPROBE. PROJECT DRAGON,
Atomic Energy Establishment, Winfrith (England).
D. Quataert, and H. W. Schleicher. Oct 65, 36p
Prepared in cooperation with European Atomic Energy Community, Ispra (Italy). Joint Nuclear Research Center.

Descriptors: (*High temperature gas cooled reactors, *Coated fuel particles), Nuclear fuel particles, X ray spectroscopy, Great Britain.
Identifiers: Dragon project.

For abstract, see NSA 24 20.
DP-Report-384 HC$3.00 MF$0.65

THE CORROSION BEHAVIOUR OF COATED FUEL PARTICLES. PROJECT DRAGON,
Atomic Energy Establishment, Winfrith (England).
N. Pollitt. Jun 68, 74p

Descriptors: (*Coated fuel particles, *Corrosion), Corrosion resistance, Great Britain.
Identifiers: Dragon project.

For abstract, see NSA 24 20.
DP-Report-395 HC$3.00 MF$0.65

REPORT ON WORK AT A.E.R.E. FOR THE DRAGON PROJECT, APRIL-OCTOBER 1965. PROJECT DRAGON.
Atomic Energy Research Establishment, Harwell (England).
For primary bibliographic entry see Field 18I.
For abstract, see NSA 24 20.
DP-Report-397 HC$3.00 MF$0.65

THE IRRADIATION PERFORMANCE OF TRIPLEX COATED (PYROCARBON/SIC/PYROCARBON) FUEL PARTICLES. PROJECT DRAGON,
Atomic Energy Establishment, Winfrith (England).
K. S. B. Rose, and G. P. Hauser. Feb 66, 25p
CONF-660318-7
Presented at the Dragon Contractors' Research and Development Symposium, Harwell (England).

Descriptors: (*High temperature gas cooled reactors, *Coated fuel particles), (*Silicon carbides, Coated fuel particles), Irradiation, Great Britain.
Identifiers: Dragon project.

For abstract, see NSA 24 20.
DP-Report-400 HC$3.00 MF$0.65

COMPUTATION OF SOME CHARACTERISTICS OF PYROCARBON LAYERS DEPOSITED ON FUEL PARTICLES FROM COATING PROCESS MEASUREMENTS. PROJECT DRAGON,
Atomic Energy Establishment, Winfrith (England).
P. Lanaspeze, and J. Schniewind. Feb 66, 52p

Descriptors: (*High temperature gas cooled reactors, *Coated fuel particles), (*Pyrolytic graphite, Coated fuel particles), Surfaces, Great Britain.
Identifiers: Dragon project.

For abstract, see NSA 24 20.
DP-Report-407 HC$3.00 MF$0.65

TESTING AND EVALUATION OF REACTOR FUEL PARTICLES. PROJECT DRAGON,
Atomic Energy Establishment, Winfrith (England).
P. Koss, and H. Bildstein. Feb 66, 34p

Descriptors: (*High temperature gas cooled reactors, *Coated fuel particles), Fission products, Xenon, Great Britain.
Identifiers: Dragon project.

For abstract, see NSA 24 20.
DP-Report-408 HC$3.00 MF$0.65

SODIUM CORROSION TESTS ON FUEL ELEMENT CANNING STEELS IN A SODIUM-COOLED FAST BREEDER REACTOR,
Division of Technical Information Extension (AEC), Oak Ridge, Tenn.
For primary bibliographic entry see Field 11F.
For abstract, see NSA 24 20.
EURFNR-753 HC$3.00 MF$0.65

HTGR BASE PROGRAM QUARTERLY PROGRESS REPORT FOR THE PERIOD ENDING MAY 31, 1970.
Gulf General Atomic, Inc., San Diego, Calif.
For primary bibliographic entry see Field 18G.
For abstract, see NSA 24 20.
GA-10088 HC$3.00 MF$0.65

FRICTION AND WEAR TESTS ON TOP REFLECTOR KEYED PLENUM ELEMENT MATERIALS OF THE FT. ST. VRAIN HTGR,
Gulf General Atomic, Inc., San Diego, Calif.
P. D. Hedgecock. 27 May 69, 17p
Contract AT (04-3)-633

Descriptors: (*Nuclear reactor materials, *Plenum chambers), (*Stainless steels, Rubbing), High temperature gas cooled reactors, Friction, Wear tests, Nuclear reactor reflectors.

For abstract, see NSA 24 20.
GAMD-9280 HC$3.00 MF$0.65

SOUTHWEST EXPERIMENTAL FAST OXIDE REACTOR DEVELOPMENT PROGRAM.
Quarterly rept. no. 24, Feb-Apr 70,
General Electric Co., Sunnyvale, Calif. Breeder Reactor Development Operation.
G. R. Pflasterer, and R. A. Becker. May 70, 70p
Contract AT (04-3)-540

Descriptors: (*Fast reactors (Nuclear), Nuclear reactor engineering), Oxide nuclear fuels, Nuclear reactor safety, Nuclear research and test reactors, Fabrication, Performance tests.
Identifiers: Southwest experimental fast oxide reactor.

For abstract, see NSA 24 20.
GEAP-10010-24 HC$3.00 MF$0.65

SODIUM-COOLED REACTORS FAST CERAMIC REACTOR DEVELOPMENT PROGRAM.
General Electric Co., Sunnyvale, Calif. Breeder Reactor Development Operation.
For primary bibliographic entry see Field 18I.
For abstract, see NSA 24 20.
GEAP-10028-33 HC$3.00 MF$0.65

DESIGN AND ANALYSIS OF SEFOR CORE I,
General Electric Co., Sunnyvale, Calif. Breeder Reactor Development Operation.

For primary bibliographic entry see Field 18I.
For abstract, see NSA 24 20.
GEAP-13598 HC$3.00 MF$0.65

FAST BREEDER REACTOR ADVANCED FUEL ELEMENT CLADDING FABRICATION.
Termination rept. (1115) covering the period 1 Jul-31 Aug 69,
General Electric Co., Cincinnati, Ohio. Nuclear Systems Programs.
R. G. Frank, and C. O. Tarr. Aug 70, 48p
Contract AT (40-1)-2847

Descriptors: (*Breeder reactors, *Nuclear fuel claddings), Fast reactors (Nuclear), Fabrication, Reactor fuels, Nuclear reactor materials, Molybdenum, Ingots, Quality control.

For abstract, see NSA 24 20.
GEMP-745 HC$3.00 MF$0.65

INTERNATIONAL ATOMIC ENERGY AGENCY, INTERNATIONAL WORKING GROUP ON FAST REACTORS MEETING OF SPECIALISTS ON SODIUM-WATER REACTIONS, ARGONNE, USA, 5-6 NOVEMBER 1968.
Argonne National Lab., Ill.
1968, 99P

Descriptors: (*Fast reactors (Nuclear), Nuclear reactor coolants), Sodium, Water, Cooling systems, Nuclear reactor engineering, Power reactors (Nuclear), Physical chemistry.

For abstract, see NSA 24 20.
IAEA/NPR-9 HC$3.00 MF$0.65

CRITICALITY CONSIDERATIONS IN BASKET DESIGN FOR IRRADIATED FUEL SHIPMENT,
Oak Ridge Gaseous Diffusion Plant, Tenn.
C. E. Newlon. 16 Apr 69, 14p CONF-690609-28
Contract W-7405-eng-26
Presented at the Annual Meeting of the American Nuclear Society (15th), Seattle, Wash. 15-19 Jun 69.

Descriptors: (*Nuclear fuels, Shipping containers), Superheater reactors, Nuclear fuel assemblies, Criticality, Neutron absorption, Radiation shielding.
Identifiers: Puerto Rico power reactor.

For abstract, see NSA 24 20.
K-L-6232 HC$3.00 MF$0.65

DESIGN AND FABRICATION OF A THERMAL SCANNER,
Los Alamos Scientific Lab., N. Mex.
For primary bibliographic entry see Field 14B.
For abstract, see NSA 24 20.
LA-4453 HC$3.00 MF$0.65

QUARTERLY STATUS REPORT ON 238Pu SPACE ELECTRIC POWER FUEL DEVELOPMENT PROGRAM, JANUARY 1-MARCH 31, 1970.
Los Alamos Scientific Lab., N. Mex.
For primary bibliographic entry see Field 18N.
For abstract, see NSA 24 20.
LA-4476 HC$3.00 MF$0.65

FRICTION AND WEAR SCREENING TESTS OF MATERIALS IN SODIUM,
Atomics International, Canoga Park, Calif. Liquid Metal Engineering Center.
N. J. Hoffman, D. E. Goggin, and J. J. Droher. 15 Jul 70, 173p
Contract AT (04-3)-700

Descriptors: (*Nuclear reactor materials, Selection), Sodium, Friction tests, Wear tests, Corrosion resistance.

For abstract, see NSA 24 20.
LMEC-70-10 HC$3.00 MF$0.65

RESULTS FROM IRRADIATION TESTING OF UO SUB 2 FUEL PINS DESIGNED FOR THE MEDIUM POWER REACTOR EXPERIMENT,
Oak Ridge National Lab., Tenn.
S. C. Weaver, R. B. Fitts, K. R. Thoms, V. A. DeCarlo, and R. L. Senn. Aug 70, 69p
Contract W-7405-eng-26

Descriptors: (*Nuclear fuel pins, Irradiation), Uranium oxides, Power reactors (Nuclear), Reactor fuels, Fission products, Nuclear fuel claddings, Metallurgy, Thermal stresses.

For abstract, see NSA 24 20.
ORNL-TM-2859 HC$3.00 MF$0.65

POSTIRRADIATION EXAMINATION OF FUEL ELEMENTS FROM CORE I AND CORE II OF THE ARMY SM-1A STATIONARY MEDIUM POWER REACTOR,
Oak Ridge National Lab., Tenn.
A. E. Richt, and V. O. Haynes. Aug 70, 95p
Contract W-7405-eng-26

Descriptors: (*Nuclear fuel elements, Irradiation), Reactor cores, Power reactors (Nuclear), Reactor fuels, Tests, Corrosion, Metallography, Radioactivity.
Identifiers: Army reactors (SM-1A).

For abstract, see NSA 24 20.
ORNL-TM-2967 HC$3.00 MF$0.65

MACHINABILITY OF PLUTONIUM,
Dow Chemical Co., Golden, Colo. Rocky Flats Div.
For primary bibliographic entry see Field 11F.
For abstract, see NSA 24 20.
REP-1428 HC$3.00 MF$0.65

REVIEW OF HIGH-TEMPERATURE RADIATION EMBRITTLEMENT OF ENGINEERING ALLOYS,
Aerojet-General Corp., Sacramento, Calif.
For primary bibliographic entry see Field 11F.
For abstract, see NSA 24 20.
RN-S-365 HC$3.00 MF$0.65

NPR LOT XIV TEST REPORT.
Nuclear Fuels Services, Inc., West Valley, N.Y.

1970, 79p
Contract AT (38-1)-344

Descriptors: (*Nuclear fuel reprocessing, *Production reactors (Nuclear)), Field tests.
Identifiers: Hanford production reactors.

For abstract, see NSA 24 20.
SRO-344-5 HC$3.00 MF$0.65

DEFORMATION OF CRYSTALS OF ALPHA PLUTONIUM IN COMPRESSION,
California Univ., Livermore. Lawrence Radiation Lab.
For primary bibliographic entry see Field 11F.
For abstract, see NSA 24 20.
UCRL-72507 HC$3.00 MF$0.65

EFFECT OF HOT WORKING ON ROOM-TEMPERATURE STRENGTH AND DUCTILITY OF A PLUTONIUM-1 WT% GALLIUM DELTA-STABLIZED ALLOY,
California Univ., Livermore. Lawrence Radiation Lab.
For primary bibliographic entry see Field 11F.
For abstract, see NSA 24 20.
UCRL-72547 HC$3.00 MF$0.65

MINUTES, SPECIALISTS MEETING ON SODIUM-WATER REACTIONS HELD UNDER THE AUSPICES OF THE INTERNATIONAL ATOMIC ENERGY AT ARGONNE NATIONAL LABORATORY, NOVEMBER 5-6, 1968,
Argonne National Lab., Ill.
Kurt Goldmann. 15 Oct 69, 56p

Descriptors: (*Liquid metal coolants, Sodium), (*Sodium, Chemical reactions), Water, Reaction kinetics.

For abstract, see NSA 24 20.
UNC-SPLM-1059 HC$3.00 MF$0.65

18K. Reactor Physics

REACTOR DEVELOPMENT PROGRAM PROGRESS REPORT, JUNE 1970.
Argonne National Lab., Ill.
For primary bibliographic entry see Field 18I.
For abstract, see NSA 24 20.
ANL-7705 HC$3.00 MF$0.65

QUARTERLY TECHNICAL PROGRESS REPORT ON AEC-SPONSORED ACTIVITIES. JANUARY-MARCH 1970.
Atomic Power Development Associates, Inc., Detroit, Mich.
For primary bibliographic entry see Field 18I.
For abstract, see NSA 24 20.
APDA-261 HC$3.00 MF$0.65

ADEP-1 AND ADEP-2: ONE-AND TWO-DIMENSIONAL FEW-GROUP KINETICS CODES,
Battelle Memorial Inst., Columbus, Ohio.
Richard S. Denning. Aug 70, 15p
Contract W-7405-eng-92

Descriptors: (*Nuclear reactor safety, Computer programs), (*Neutron flux, Diffusion), Reactor cores, Partial differential equations, Operators (Mathematics).
Identifiers: ADEP 1 computer code, ADEP 2 computer code.

For abstract, see NSA 24 20.
BMI-1888 HC$3.00 MF$0.65

EXPERIMENTS AND CALCULATIONS FOR H2O-MODERATED ASSEMBLIES CONTAINING UO2-2 WT. PERCENT PuO2 FUEL RODS,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
V. O. Uotinen, and L. D. Williams. 23 May 67, 33p
CONF-670602-33
Contract AT (45-1)-1830
Presented at the Annual Meeting of the American Nuclear Society (13th), San Diego, Calif.

Descriptors: (*Critical assemblies, Experimentation), Nuclear fuel rods, Reactor cores, Nuclear fuels, Nuclear reactor reactivity.

For abstract, see NSA 24 20.
BNWL-SA-1107 HC$3.00 MF$0.65

PLUTONIUM UTILIZATION PROGRAM.
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
For primary bibliographic entry see Field 18J.
For abstract, see NSA 24 20.
BNWL-1442 HC$3.00 MF$0.65

A METHOD OF CALCULATING RESONANCE INTEGRALS IN GRAPHITE MODERATED HETEROGENEOUS REACTORS. PROJECT DRAGON,
Atomic Energy Establishment, Winfrith (England).
E. Fossoul, N. Meyvaert, and F. Servais. Jun 65, 77p
Prepared in cooperation with Societe Belge pour l'Industrie Nucleaire, (Brussels).

Descriptors: (*High temperature gas cooled reactors, Graphite moderated reactors), (*Neutron flux, Resonance), Heterogeneous reactors (Nuclear), Plutonium, Nuclear reactor engineering, Moderators, Design, Great Britain.
Identifiers: Dragon project.

For abstract, see NSA 24 20.
DP-Report-357 HC$3.00 MF$0.65

MEASUREMENTS OF CONTROL ROD WORTH AND EXCESS REACTIVITY ON THE FIRST CORE OF DRAGON. PROJECT DRAGON,
Atomic Energy Establishment, Winfrith (England).
For primary bibliographic entry see Field 18I.
For abstract, see NSA 24 20.
DP-Report-359 HC$3.00 MF$0.65

DESIGN AND ANALYSIS OF SEFOR CORE I,
General Electric Co., Sunnyvale, Calif. Breeder Reactor Development Operation.
For primary bibliographic entry see Field 18I.
For abstract, see NSA 24 20.
GEAP-13598 HC$3.00 MF$0.65

DIGITAL COMPUTATION OF POWER SPECTRAL DENSITY CURVES FROM REACTOR NOISE DATA,
Idaho Nuclear Corp., Idaho Falls.
Barry Jay Kramer. Jun 70, 199p
Contract AT (10-1)-1230

Descriptors: (*Neutron flux, Variations), (*Neutron spectra, Spectrum analysis), Power spectra, Nuclear reactor engineering, Computer programs, Algorithms.
Identifiers: *Reactor noise, Fast fourier transform.

For abstract, see NSA 24 20.
IN-1374 HC$3.00 MF$0.65

NUCLEAR SAFETY ANALYSIS OF MODERATION-CONTROLLED 48-IN.-ID HEAVY-WALL UF_6 CYLINDERS,
Oak Ridge Gaseous Diffusion Plant, Tenn.
C. E. Newlon, and R. G. Taylor. 10 Aug 70, 12p
Contract W-7405-eng-26

Descriptors: (*Critical assemblies, Nuclear reactor safety), Uranium fluorides, Cylinders, Nuclear reactor materials.

For abstract, see NSA 24 20.
K-L-6255 HC$3.00 MF$0.65

SHIELDING BENCHMARK PROBLEMS,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 18F.
For abstract, see NSA 24 20.
ORNL-RSIC-25 (Suppl.1) HC$3.00 MF$0.65

TWO OVERLAPPING GROUP-TRANSPORT APPROXIMATION FOR THERMAL NEUTRON PROBLEMS,
Bettis Atomic Power Lab., Pittsburgh, Pa.
For primary bibliographic entry see Field 20H.
For abstract, see NSA 24 20.
WAPD-T-2341 HC$3.00 MF$0.65

18L. Reactors (Power)

COMPUTER HANDLING OF REACTOR DATA FOR SAFETY: CHORD-S,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 18I.
For abstract, see NSA 24 20.
ORNL-TM-2928 HC$3.00 MF$0.65

QUALITY-ASSURANCE PRACTICES IN CONSTRUCTION AND MAINTENANCE OF THE MOLTEN-SALT REACTOR EXPERIMENT,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 18I.
For abstract, see NSA 24 20.
ORNL-TM-2999 HC$3.00 MF$0.65

18M. Reactors (Non-Power)

EDUCATIONAL AND RESEARCH ACTIVITIES JANUARY 1, 1969-DECEMBER 31, 1969.
Michigan Univ., Ann Arbor. Michigan Memorial Phoenix Project.
May 70, 22p
Contract AT (11-1)-385

Descriptors: (*Nuclear research and test reactors, Education), Swimming pool reactors, Water moderated reactors, Reviews, Operations.
Identifiers: Michigan research reactor, Phoenix Project.

For abstract, see NSA 24 20.
COO-385-3 HC$3.00 MF$0.65

18N. SNAP Technology

LARGE RADIOISOTOPE HEAT SOURCE CAPSULE PROGRAM. TOPICAL REPORT NO. 10. CREEP OF T-111 RADIOISOTOPE CONTAINMENT VESSELS UNDER INCREASING PRESSURE,
Atomics International, Canoga Park, Calif.
For primary bibliographic entry see Field 11F.
For abstract, see NSA 24 20.
AI-AEC-12943 HC$3.00 MF$0.65

LARGE RADIOISOTOPE HEAT SOURCE CAPSULE PROGRAM. TOPICAL REPORT NO. 11. MATERIALS COMPATIBILITY,
Atomics International, Canoga Park, Calif.
Robert G. Brengle. 3 Jul 70, 108p
Contract AT (29-2)-2338

Descriptors: (*Radioisotope heat sources, Containers), Nuclear auxillary power units, Tantalum alloys, Niobium alloys, Molybdenum alloys, Platinum alloys, Refractories, Ceramics, Compatibility.
Identifiers: Tantalum alloy T-111, Niobium alloy 1 zr, Molybdenum alloy TZM, Platinum alloy 20 Rh.

For abstract, see NSA 24 20.
AI-AEC-12966 HC$3.00 MF$0.65

LARGE RADIOISOTOPE HEAT SOURCE CAPSULE PROGRAM. TOPICAL REPORT NO. 12. TRANSIT CAPSULE PROCESS METALLURGY,
Atomics International, Canoga Park, Calif.
Robert G. Brengle. 3 Jul 70, 50p
Contract AT (29-2)-2338

Descriptors: (*Radioisotope heat sources, Containers), Nuclear auxillary power units, Tantalum alloys, Platinum alloys, Metallography.
Identifiers: Tantalum alloy T-111, Tantalum alloy 10 W, Platinum alloy 20 Rh.

For abstract, see NSA 24 20.
AI-AEC-12967 HC$3.00 MF$0.65

QUARTERLY STATUS REPORT ON 238Pu SPACE ELECTRIC POWER FUEL DEVELOPMENT PROGRAM, JANUARY 1-MARCH 31, 1970.
Los Alamos Scientific Lab., N. Mex.

Jul 70, 17p
Contract W-7405-eng-36

Descriptors: (*Spacecraft electric power units, *Oxide nuclear fuels), Energy conversion heat sources, Plutonium 238, Plutonium oxides, Thorium oxides, Coatings, Nuclear reactor engineering, Ceramic nuclear fuels.

For abstract, see NSA 24 20.
LA-4476 HC$3.00 MF$0.65

BIFOLD NUCLEAR POWER SOURCE,
Mound Lab., Miamisburg, Ohio.
W. F. Stubbins. 30 Sep 66, 13p
Contract AT (33-1)-GEN-53

Descriptors: (*Plutonium 238, *Nuclear auxiliary power units), Fast neutrons, Fission cross sections, Critical assemblies.
Identifiers: SNAP.

For abstract, see NSA 24 20.
MLM-1357 HC$3.00 MF$0.65

AEROSPACE NUCLEAR SAFETY PROGRAM.
Quarterly rept. 1 Apr-30 Jun 70,
Sandia Labs., Albuquerque, N. Mex.
R. G. Illing. Jul 70, 61p

Descriptors: (*Spacecraft, Nuclear auxiliary power units), (*Radioisotope heat sources, Safety), (*Radioisotope thermoelectric devices, Safety), Manned spacecraft, Heat shielding, Ablation, Aerodynamics, Model test, Heat measurement, Reentry trajectories, Reentry simulation, Nuclear fuels, Irradiation, Infrared detection.
Identifiers: Pioneer spacecraft, Viking, SNAP, Apollo 13 spacecraft, Athena H reentry vehicle, SNAP 27.

For abstract, see NSA 24 20.
SC-PR-70-435 HC$3.00 MF$0.65

THE DESIGN, DEVELOPMENT AND DELIVERY OF HIGH TEMPERATURE VACUUM INSULATION SYSTEMS FOR SNAP-21 THERMOELECTRIC POWER SYSTEM.
Final rept.,
Union Carbide Corp., Tonawanda, N.Y. Linde Div.
L. R. Niendorf. 1970 114p
Contract AT (30-1)-3691
Prepared in cooperation with Minnesota Mining and Mfg. Co., St. Paul.

Descriptors: (*Nuclear auxiliary power units, Radioisotope thermoelectric devices), (*Thermal insulation, Design), Thermoelectric power generation, Nuclear reactor engineering, Nickel, Foils (Materials), Copper, Aluminum foil, Hastelloy, Stainless steels, Design.
Identifiers: SNAP 21, SNAP.

For abstract, see NSA 24 20.
TID-25482 (App.) HC$3.00 MF$0.65

19. ORDNANCE

19A. Ammunition, Explosives, and Pyrotechnics

EXPLOSIVE ELECTROSTATIC SENSITIVITY TESTER, THE DESIGN, ASSEMBLY, AND OPERATION OF.
Naval Ordnance Lab White Oak Md
For primary bibliographic entry see Field 14B.
AD-713 397 HC$3.00 MF$0.65

POWER SUPPLY INITIATION USING INERTIAL IGNITER TO FIRE M42G PRIMER,
Harry Diamond Labs Washington D C
Edward R. Murray. Oct 69, 20p Rept no. HDL-TM-69-37

Descriptors: (*Primers, Design), Optimization, Helical springs, Mechanical impedance, Firing

mechanisms (Weapon), Test methods, Failure (Mechanics).
Identifiers: M-42 primers.

The inertial igniter assembly is redesigned to fire an M42G primer. An analytical approach is used to find the optimum design of the striker spring taking into consideration the criteria necessary to fire the M42G primer. Empirical data gathered by test firings are used to evaluate the analytical design. A generalized method of solution is presented that may serve as a standard approach for any future design of a similar mechanism. (Author)
AD-713 407 HC$3.00 MF$0.65

METHODS OF REDUCING THE HAZARDS OF RADIO FREQUENCY ENERGY TO MILITARY ELECTRIC BLASTING DEVICES.
Research paper,
Army Command and General Staff Coll Fort Leavenworth Kans
Benjamin R. Schlapak. 1970, 123p

Descriptors: (*Explosives initiators, Electromagnetic fields), (*Land mines, Detonations), Propagation, Radiofrequency pulses, Electrostatic fields, Lightning, Hazards, Electromagnetic shielding, Antipersonnel ammunition, Attenuation.
Identifiers: M-18 mines, Claymore mines, Premature detonations.

The report describes problems encountered by premature detonations of electrically primed explosives as a result of radio frequency induced currents. Solutions to the problems are presented.
AD-713 413 HC$3.00 MF$0.65

A SOFTWARE SYSTEM ORIENTED TO FUZE TESTING (SOSOFT),
Harry Diamond Labs Washington D C
Donald A. Link, and David J. Buscher. Jun 70, 167p Rept no. HDL-TR-1515

Descriptors: (*Firing tests (Ordnance), *Computer programs), (*Fuzes (Ordnance), Simulation), Real time, Scheduling, Computer logic, Control sequences, Fuze functioning elements, Programming (Computers).
Identifiers: XM-596 fuzes, M-596 fuzes, Computer analysis, Computerized simulation, SOSOFT (Software System Oriented to Fuze Testing), Software system oriented to fuze testing.

Software techniques used in an automated real-time fuze testing system are discussed. Most of the techniques are independent of the electrical circuit being tested and the computer controlling the system. Although the software described was initially designed for testing the XM596 proximity fuze, only the actual fuze testing programs need be specifically designed for a given testing system. The programs comprising SOSOFT are functionally organized into eight major subsystems--real-time priority scheduling system, interrupt servicing system, input/output control system, executive utility system, basic testing system, data-display system, conversational control system, and reliability monitoring system. (Author)
AD-713 419 HC$3.00 MF$0.65

THE PERFORMANCE OF SMALL ARMS AMMUNITION WHEN FIRED INTO WATER,
Naval Ordnance Lab White Oak Md
Barry J. Noonan, and Howard K. Steves. 8 Sep 70, 26p Rept no. NOLTR-70-174

Descriptors: (*Terminal ballistics, Small arms ammunition), (*Small arms ammunition, Water entry), Equations of motion, Deformation, Impact shock, Shock resistance, Projectile trajectories, Underwater trajectories, Test methods.
Identifiers: M-60 guns (7.62-MM), M-16 guns (5.56-MM), Slant range.

Standard small arms ammunition was tested by firing into water from air. The test results show this ammunition to be relatively ineffective in water, having a lethal slant range of 1.5 feet. By proper design of the projectile, staying within the restrictions for standard ammunition, the lethal slant range can be increased to about 8 feet. (Author)
AD-713 445 HC$3.00 MF$0.65

COMPUTER OPERATED AUTOMATIC FUZE TESTING SYSTEMS,
Harry Diamond Labs Washington D C
Roger P. Chase. 1970, 8p

Descriptors: (*Fuzes (Ordnance), Test equipment), (*Special purpose computers, Data processing systems), Real time, Scheduling, Statistical distributions, Measuring devices (Electrical + electronic), Data transmission systems, Computer logic, Data storage systems.
Identifiers: XM-596 fuzes, M-596 fuzes, Computer analysis.

The report describes a general purpose data acquisition and control system designed to test circuit operations of electric fuzes produced on an automated production line.
AD-713 515 HC$3.00 MF$0.65

MATHEMATICAL MODEL FOR PROJECTILE BODY,
Frankford Arsenal Philadelphia Pa
Leonard M. Gold, and Frank Shinaly. 1970, 14p

Descriptors: (*Projectiles, Mathematical models), (*Small arms ammunition, Cartridges), Obturation (Ballistics), Aerodynamic loading, Projectile trajectories, Rifling, Stresses, Differential equations, Bodies of revolution.
Identifiers: Computerized simulation, Computer analysis.

The report is an expansion of normal analytical methods of mathematically modelling of projectile bodies whereby true projectile geometry is more truly defined.
AD-713 529 HC$3.00 MF$0.65

DETONATION PRESSURE MEASUREMENTS IN TNT AND OCTOL,
Ballistic Research Labs Aberdeen Proving Ground Md
Robert L. Jameson, and Albert L. Hawkins. 1970, 14p

Descriptors: (*Explosive materials, Detonation waves), Pressure, Measurement, TNT, HMX, Exterior ballistics, Acrylic resins, Shock waves, Experimental data.
Identifiers: Shock plates, Octol, Hugoniot properties.

Von Neumann has characterized a one-dimensional detonation wave as a shock wave in the unreacted explosive followed by a reaction zone which ends at a region designated the Chapman-Jouguet plane. Throughout this model there are several points that are important to the physical understanding of the detonation process and to its military and scientific application. These points are the Chapman-Jouguet pressure, the von Neumann spike pressure and the reaction zone length. Measurements were made of phenomena closely associated with these detonation parameters and values for them are inferred where possible. When difficulties exclude a definitive result the problem is analyzed and possible courses of future action indicated. The two explosives that have been selected for this study are cast TNT and cast Octol.
AD-713 547 HC$3.00 MF$0.65

GASEOUS ILLUMINANT PYROTECHNIC SYSTEMS,
Picatinny Arsenal Dover N J Pyrotechnics Lab
Abraham D. Kirshenbaum, and Francis R. Taylor. 1969, 15p

Descriptors: (*Pyrotechnics, *Luminescence), (*Illuminating projectiles, Brightness), (*Boron compounds, Illuminating projectiles), (*Oxyfluorides, Illuminating projectiles), Gases, Fluorides, Hydrogen, Oxygen, Oxides, Burning rate, Flames, Alkynes.
Identifiers: *Boron fluorides, *Boron oxides, Acetylene.

Candlepower efficiencies obtainable with conventional pyrotechnic systems such as magnesium-sodium nitrate have essentially reached a maximum. Thus an intensive study was initiated to determine if gaseous systems could develop luminous efficiencies exceeding those of standard solid systems. The following conclusions were drawn from the photometric and spectroscopic studies and the theoretical computer analyses of these systems: The best practical systems are the H2 + OF2 + BF3 and H2 + O2 + F2 + BF3 flames; The presence of oxygen as air, O2 or OF2 is essential for maximum light output; Computer analyses have shown that high temperatures are necessary for obtaining high efficiencies; The reaction mechanism in these systems essentially involves the hydrolysis of the boron fluorides to BOF and BO2H which are subsequently converted to the primary emitters BO2* and BO*; Burner design is also of utmost importance; and The light outputs of these gaseous systems are greatly increased by the use of reflectors as shown by the 12 fold increase for the H2 + OF2 + BF3 system. (Author)
AD-713 550 HC$3.00 MF$0.65

THE PREPARATION AND PROPERTIES OF NEW OXIDIZERS FOR PROPELLANTS, NH4C104-KC104 and NH4C104-NH4NO3 MIXED CRYSTALS,
Picatinny Arsenal Dover N J
Scott I. Morrow. 1970, 12p

Descriptors: (*Oxidizers, Synthesis (Chemistry)), (*Ammonium perchlorate, *Explosions), Phase studies, Crystal lattices, Mixtures, Nitrates, Thermal stability.
Identifiers: *Ammonium nitrate.

It was demonstrated that isomorphous and phase rule concepts can be used as a theoretical guide for obtaining valuable new oxidizer 'alloys'. New synthesis techniques were explored to facilitate preparation of NH4ClO4-KClO4 and NH4ClO4-NH4NO3 'alloys' on an expanded scale. It was found that it was considerably more difficult to make the latter type of homogeneous mixed crystals. This was due to the theoretically predicted lack of ideality of the behavior of this salt pair in water. It was shown that introduction of NH4CLO4 into the crystal lattice of NH4NO3 tends to increase the latter's thermal stability and decrease its sensitivity to moisture. At the same time NH4NO3 appears to reduce the impact sensitivity of NH4ClO4. These are desirable effects from a propellant and explosive standpoint. (Author)
AD-713 564 HC$3.00 MF$0.65

USE OF ACTIVATION ANALYSIS FOR DETERMINING WEIGHT OF PELLET IN M34 PRIMERS,
Army Materials and Mechanics Research Center Watertown Mass
For primary bibliographic entry see Field 14B.
AD-713 571 HC$3.00 MF$0.65

STRUCTURE AND LATTICE DYNAMICS OF METAL AZIDES AND THEIR RELATIONSHIP TO STABILITY,
Picatinny Arsenal Dover N J Feltman Research Labs
For primary bibliographic entry see Field 20B.
AD-713 585 HC$3.00 MF$0.65

Group 19A—Ammunition, Explosives, and Pyrotechnics

CRITICAL COMBAT PERFORMANCES, KNOWLEDGE, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: DEMOLITIONS AND BOOBYTRAPS.
Research By-Product,
George Washington Univ Alexandria Va Human Resources Research Office
George J. Magner, and T. R. Powers. Dec 68, 19p
Contract DA-44-188-ARO-2

Descriptors: (*Demolitions, Army training), (*Combat surveillance, Army training), (*Infantry, Leadership), Mine clearance, Explosive materials, Warfare, Instruction manuals, Performance (Human).
Identifiers: *Infantry rifle squad leaders.

The paper identifies the knowledges, skills, and performances required of the Infantry rifle squad leader in the areas of demolitions and boobytraps. It presents procedures on the inspection, emplacing, priming, and detonating of explosive charges together with discussions on the types of explosives, types of targets, and the administrative considerations involved in such work. (Author)
AD-713 755 HC$3.00 MF$0.65

MECHANICAL TIME FUZE (Mekhanicheskaya Distantsi Onnaya),
Army Foreign Science and Technology Center Washington D C
N. P. Novikov. 1 Sep 70, 7p Rept no. FSTC-HT-23-291-70
Trans. of Patent (USSR) 163 506.

Descriptors: (*Time-delay fuzes, Design), Fuze setters, Clock delay mechanisms, Helical springs, Firing mechanisms (Weapon), Pins (Mechanical), Patents, USSR.
Identifiers: Translations.

The mechanical time fuze with a Krupp system regulator used for artillery shells is equipped with a spiral spring which winds up at firing. It differs by its use of a notched shaft as the setting ring emplaced on the main shaft and set to the required angle with respect to the regulator pinion. This device, after the pinon has been rotated to the required angle and is uncoupled from the regulator, is used to release the spring-powered striker being held in place by the shaft. (Author)
AD-713 788 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: PORTABLE FLAMETHROWERS.
Research By-Product,
George Washington Univ Alexandria Va Human Resources Research Office
Henry E. Kelly. Dec 68, 20p
Contract DA-44-188-ARO-2

Descriptors: (*Flamethrowers, Army training), (*Combat surveillance, Army training), (*Infantry, Leadership), Performance (Human), Warfare, Instruction manuals.
Identifiers: *Infantry rifle squad leaders.

The paper covers the critical combat performances, knowledges, and skills required of the Infantry rifle squad leader when directing the employment of portable flamethrowers by members of his squad or by attached personnel in combat operations employing flame. (Author)
AD-713 801 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: MINES, ANTITANK AND ANTIPERSONNEL, AND WARNING AND ILLUMINATING DEVICES.
Research By-Product,
George Washington Univ Alexandria Va Human Resources Research Office
Fred K. Cleary, and Theodore R. Powers. 26 Mar 69, 42p
Contracts DA-44-188-ARO-2, DAHC19-69-C-0018

Descriptors: (*Minelaying, Army training), (*Combat surveillance, Army training), (*Infantry, Leadership), Performance (Human), Warfare, Mines (Ordnance), Warning systems, Signals, Instruction manuals, Illumination.
Identifiers: *Infantry rifle squad leaders, Illuminating devices.

The paper deals with the employment of mines as obstacles and sets forth the performances, knowledges, and skills required of the Infantry rifle squad leader to educate, train, and practice his men in applying landmine warfare techniques and to plan, prepare for, direct, and supervise their performance of the various tasks they may be assigned when part of a mine laying unit. It covers, also, the same factors as they apply to the squad's use of warning and illuminating devices. (Author)
AD-713 812 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: PROTECTION AGAINST MINES, BOOBYTRAPS, AND WARNING AND ILLUMINATING DEVICES.
Research By-Product,
George Washington Univ Alexandria Va Human Resources Research Office
Frank L. Brown, and John D. Loomis. Dec 68, 32p
Contract DA-44-188-ARO-2

Descriptors: (*Mines (Ordnance), Army training), (*Signals, Army training), (*Combat surveillance, Army training), (*Infantry, Leadership), Warning systems, Illumination, Warfare, Instruction manuals.
Identifiers: *Infantry rifle squad leaders.

The detection, location, identification, avoidance, marking, and reporting of enemy and unrecorded friendly mines, boobytraps, and warning and illuminating devices, and similar incapacitating devices are covered, as is the use of one metallic mine-detection set. The Infantry rifle squad leader is cast in the role of the mine-detection set operator, and an assumption is made that if the Infantry rifle squad leader can operate and maintain the equipment he can train and supervise operators to meet the demands of his unit missions. (Author)
AD-713 815 HC$3.00 MF$0.65

THERMAL DECOMPOSITION AND EXPLOSION OF AMMONIUM PERCHLORATE AND AMMONIUM PERCHLORATE PROPELLANT UP TO FIFTY KILOBARS.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
For primary bibliographic entry see Field 7B.
For abstract, see STAR 08 21.
N70-38503 HC$3.00 MF$0.65

EXPLODING WIRES AS SHOCK-WAVES SOURCES,
Sandia Labs., Albuquerque, N. Mex.
G. A. Carlson. Jul 70, 24p

Descriptors: (*Exploding wires, *Shock waves), (*Detonators, Gases), Circuits, Overpressure, Detonations, Electric wire, Capacitors.

For abstract, see NSA 24 20.
SC-RR-70-65 HC$3.00 MF$0.65

19B. Bombs

CONSOLIDATED QUARTERLY REPORT FOR THE PERIOD OCTOBER 1, 1969 TO DECEMBER 31, 1969.
Utah Univ Salt Lake City Microwave Device and Physical Electronics Lab
For primary bibliographic entry see Field 20E.
AD-713 157 HC$3.00 MF$0.65

19C. Combat Vehicles

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: ARMORED PERSONNEL CARRIER.
Research By-Product,
George Washington Univ Alexandria Va Human Resources Research Office
George J. Magner, and Johnnie O. Holder. Dec 68, 14p
Contract DA-44-188-ARO-2

Descriptors: (*Armored vehicles, Army training), (*Combat surveillance, Army training), (*Infantry, Leadership), Maintenance, Amphibious operations, Machine guns, Warfare, Instruction manuals.
Identifiers: *Infantry rifle squad leaders.

The paper outlines the pertinent performances, knowledges, and skills required of the Infantry rifle squad leader to maintain his assigned vehicle and components in a serviceable condition under all conditions of visibility. (Author)
AD-713 809 HC$3.00 MF$0.65

19D. Explosions, Ballistics, and Armor

STATIC DETERMINATION OF THE EQUATION-OF-STATE OF CEDAR CITY TONALITE.
Battelle Memorial Inst Columbus Ohio Columbus Labs
For primary bibliographic entry see Field 8G.
AD-713 175 HC$3.00 MF$0.65

THE PERFORMANCE OF SMALL ARMS AMMUNITION WHEN FIRED INTO WATER,
Naval Ordnance Lab White Oak Md
For primary bibliographic entry see Field 19A.
AD-713 445 HC$3.00 MF$0.65

PREDICTION OF HIGH VELOCITY SOLID PROPELLANT GUN PERFORMANCE BY GAS DYNAMIC COMPUTER PROGRAM,
Ballistic Research Labs Aberdeen Proving Ground Md
For primary bibliographic entry see Field 19F.
AD-713 506 HC$3.00 MF$0.65

RESPONSE OF SELECTED MATERIALS TO HIGH-SPEED FRAGMENT IMPACT,
Army Engineer Waterways Experiment Station Vicksburg Miss
Jerry W. Brown. 1970, 13p

Descriptors: (*Fragmentation, Penetration), (*Impact tests, Materials), Structural properties, Ammunition damage, Fragmentation ammunition, Projectiles, Tensile properties, Shear stresses, Strain (Mechanics), Plywood, Sand, Clay, Textiles.

The eventual objective of the study of fragment mechanics was to obtain information on the ability of various materials to stop the penetration of fragments from indirect fire weapons and to define the optimum orientation of these materials whether used singularly or in combination with each other. Before this main objective could be realized, several intermediate goals had to be reached. A logical method of simulating a fragment by some standard projectile had to be selected, and a facility for propelling the projectile under closely controlled conditions had to be constructed. Researchers had to choose, from among a large number of possible protective materials, those few that best met Army needs regarding availability, cost, weight, ease of construction, and effectiveness. A test program had to be conducted and the accumulated data had to be analyzed in order to categorize the best of the available data. Those materials showing promise in

the laboratory were selected for full-scale field testing. This paper describes the handling of each of these steps and lists the conclusions drawn from each phase of the work.
AD-713 513 HC$3.00 MF$0.65

FAR FIELD CHARACTERISTICS OF GROUND SHOCK INDUCED BY EXPLOSIONS,
Army Engineer Waterways Experiment Station Vicksburg Miss
For primary bibliographic entry see Field 18C.
AD-713 521 HC$3.00 MF$0.65

DETONATION STRUCTURE IN CONDENSED PHASE EXPLOSIVES,
Ballistic Research Labs Aberdeen Proving Ground Md
Philip M. Howe. 1969, 12p

Descriptors: (*Explosive materials, *Detonations), Shock waves, Liquids, Solids, TNT.
Identifiers: Liquid explosives, Nitromethane.

The purpose of the investigation was to extend some of the results and knowledge of nonsteady effects in the gas phase to liquid and solid explosives, where the physical and chemical conditions are extremely different. It was of considerable interest to determine how general to detonation phenomena transverse structure is and how the structure is affected by the conditions peculiar to liquid and solid explosives. (Author)
AD-713 541 HC$3.00 MF$0.65

DETONATION PRESSURE MEASUREMENTS IN TNT AND OCTOL,
Ballistic Research Labs Aberdeen Proving Ground Md
For primary bibliographic entry see Field 19A.
AD-713 547 HC$3.00 MF$0.65

RUBBER TOUGHENED ACRYLIC POLYMERS FOR ARMOR APPLICATIONS,
Army Materials and Mechanics Research Center Watertown Mass
Robert W. Lewis, Margaret E. Roylance, and George R. Thomas. 1970, 13p*

Descriptors: (*Armor, *Acrylic resins), (*Rubber, *Reinforcing materials), Particles, Electron microscopy, Impact tests, Terminal ballistics, Mechanical properties.
Identifiers: *Polymethyl methacrylate, *Filled thermoplastics, *Particulate composites.

A program on the mechanical and dynamic properties of rubber toughened acrylic polymers has led to advanced materials. Improvements were achieved through the modification of polymethylmethacrylate (PMMA) by inclusion of rubber particles in the polymeric matrix. In the investigation a series of rubber modified acrylics was examined over a range of rubber contents from zero to 16 percent with marked improvements in the ballistic resistance being obtained. (Author)
AD-713 558 HC$3.00 MF$0.65

PRECURSOR WAVES FROM A CONTINUOUS TRANSITION LAYER IN THE SOUND SPEED PROFILE.
Cambridge Acoustical Associates Inc Mass
For primary bibliographic entry see Field 20A.
AD-713 601 HC$3.00 MF$0.65

DERIVATIONS OF THE FORMULA f=1 - e to the minus nL/A power FOR THE EXPECTED FRACTION OF CASUALTIES CAUSED BY EXPLOSIVE ORDNANCE FIRED INTO A TARGET AREA,
Rand Corp Santa Monica Calif
R. L. Helmbold. Oct 70, 12p Rept no. P-4473

Descriptors: (*Explosion effects, Casualties), (*Casualties, Probability), Probability density functions, Convergence, Integral equations, Set theory, Theorems.

The formula f = 1 - e to the minus nL/A power is frequently quoted for the expected fraction of casualties from explosive munitions fired into an area. However, the author has never seen a derivation of this formula that would stand close inspection. It is the purpose of this paper to put forward two derivations of this formula soundly based on rigorous mathematical principles. (Author)
AD-713 618 HC$3.00 MF$0.65

19E. Fire Control and Bombing Systems

TARGET ALLOCATION FOR FIELD ARTILLERY.
Master's thesis,
Naval Postgraduate School Monterey Calif
John Francis Gulla. Sep 70, 70p

Descriptors: (*Artillery fire, Mathematical models), Target acquisition, Artillery, Fire control systems, Close support, Artillery units, Kill probabilities, Lanchester equations, Theses.
Identifiers: *Target allocation.

Several models of the problem of target selection for field artillery fire as a supporting weapon system to a maneuver element in a division field environment are presented in this thesis. The field artillery system, its capabilities and limitations, as well as, the criteria utilized by military decision makers to provide timely, accurate, and effective artillery fire support to the maneuver commander, is covered to familiarize the analyst with the system to be modeled. A differential equation model using Lanchester Theory of Combat and the mathematical technique of optimal control to the target allocation problem is presented. A second model presented uses an allocation of fire dependent upon the kill potential and capability of the respective forces. The kill potential varies with the lethality and range of the weapon system from that force. A discussion of the worth of combat units in dynamic combat situations is also presented. The conclusion reached is that there is a dire need for more models in the area of target allocation that can clearly depict reality and still maintain a certain mathematical tractability. (Author)
AD-713 078 HC$3.00 MF$0.65

ADVANCED COMPUTATIONAL ALGORITHMS FOR LARGE SCALE, THREE DIMENSIONAL, ARTILLERY SURVEY APPLICATIONS,
Army Engineer Topographic Labs Fort Belvoir Va
Lawrence A. Gambino. 1970, 15p

Descriptors: (*Artillery fire, Range finding), (*Data processing systems, Numerical analysis), Tactical warfare, Ranges (Distance), Regression analysis, Matrix algebra, Algorithms.
Identifiers: LRPDS (Long Range Position Determining System), Long range position determining systems, Data reduction, Computation, Computer aided analysis.

It is the purpose of this paper to demonstrate how a newly derived set of computational algorithms allows complete flexibility and rigor in solving for tracking station coordinates and their associated error models in a large, simultaneous, three dimensional adjustment. The algorithms will be used to solve a hypothetical, artillery survey problem. The new system is called the Long Range Position Determining System (LRPDS), and it is being investigated for its application in the artillery problem. The new algorithms are considered to provide a major computational break-through for efficiently handling very large, Second Order Regression Schemes, and they allow the engineer to extend his hypotheses associated with problems of systematic errors. It is the purpose of this paper to develop a Second Order Regression Scheme for LRPDS and to show that it is computationally feasible to invert this large system of equations for its solution and error propagation. (Author)
AD-713 525 HC$3.00 MF$0.65

19F. Guns

PREDICTION OF HIGH VELOCITY SOLID PROPELLANT GUN PERFORMANCE BY GAS DYNAMIC COMPUTER PROGRAM,
Ballistic Research Labs Aberdeen Proving Ground Md
Paul G. Baer. 1970, 15p

Descriptors: (*Rifles, Ammunition propellants), (*Interior ballistics, Mathematical models), Hypervelocity guns (Ordnance), Hypervelocity projectiles (Ordnance), Gases, Specific heat, Propellant grains, Obturation (Ballistics), Burning rate, Mathematical prediction.
Identifiers: Caseless ammunition, Gas dynamics, Finite difference analysis, Computer analysis.

The report describes the development of a one-dimensional gas dynamic computer model capable of predicting the interior ballistic phenomena of a solid propellant caseless projectile.
AD-713 506 HC$3.00 MF$0.65

THE ROLE OF FRACTURE TOUGHNESS AND RESIDUAL STRESSES IN THE FATIGUE AND FRACTURE BEHAVIOR OF LARGE THICK-WALLED PRESSURE VESSELS,
Watervliet Arsenal N Y
Thomas E. Davidson, Joseph F. Throop, and Albert N. Reiner. 1970, 15p

Descriptors: (*Gun barrels, Fracture (Mechanics)), Pressure vessels, Stresses, Fatigue (Mechanics), Cracks, Crack propagation, Pressure, Hydraulic systems, Test methods.
Identifiers: Autofrettage.

Summarized are the results of an investigation into the fatigue and fracture behavior of large thick-walled cylinders identical in configuration to a 175mm cannon tube. Crack growth rates and fatigue life data are presented for materials of three strength levels and different fracture toughness levels. The effects of autofrettage were examined and found to improve the fatigue life significantly. This improvement in life is shown to be the result of retardation of the fatigue crack growth rate at small crack depths. This observation, along with the relationship between fracture toughness, critical crack depth and fracture mode, is interpreted in terms of recent advancements in the application of fracture mechanics to the case of a cylinder under internal pressure. (Author)
AD-713 519 HC$3.00 MF$0.65

M16 RIFLE/AMMUNITION MALFUNCTION MODELING,
Frankford Arsenal Philadelphia Pa
Harry A. Greveris. 1970, 16p

Descriptors: (*Rifles, Malfunctions), (*Firing tests (Ordnance), Mathematical models), Interior ballistics, Force (Mechanics), Damping, Nonlinear differential equations, Interactions, Cyclic rate, Helical springs, Response, Monte Carlo method.
Identifiers: M-16 guns (5.56-MM).

The M16 rifle system provides an appropriate basis for a discussion of the malfunction modeling procedure. A brief description of the rifle mechanism functioning process together with the governing equations is presented. The system characteristic signature curve is introduced and its relevance to malfunctions explained. The signature curve is unique for each system and relates the cyclic rate of the rifle in terms of ammunition ballistics. Malfunction criteria superimposed on this curve establishes the probability of system

malfunctioning. The key element in this procedure is embodied in equipment designed to measure certain system parameters nondestructively. These parameters provide feeder material for the mathematical model developed to produce the characteristic curve. Conclusion of the subject is in the form of use and potential to rifle and ammunition producers. (Author)
AD-713 532 HC$3.00 MF$0.65

MECHANICAL DISPERSION OF A MACHINE GUN SYSTEM WITH STOCHASTIC EXCITATIONS,
Army Weapons Command Rock Island Ill
H. M. Hung. 1970, 12p

Descriptors: (*Firing tests (Ordnance), Numerical analysis), (*Machine guns, Mechanical waves), Gun mounts, Vibration, Stochastic processes, Harmonic analysis, Recoil mechanisms, Equations of motion, Excitation, Response, Probability density functions, Cyclic rate.
Identifiers: Mechanical dispersion.

It is shown that the mechanical dispersion of a conceptual machine gun system under steady firing with some uncertainty in the excitations can be determined by a stochastic dynamic analysis. The acquisition of th mechanical dispersion by the approach presented may provide a rational point of departure for a subsequent study in the system effectiveness involving exterior ballistics and terminal effects. (Author)
AD-713 544 HC$3.00 MF$0.65

THE DEVELOPMENT OF COMBAT RELATED MEASURES FOR SMALL ARMS EVALUATION,
Army Infantry Board Fort Benning Ga
Ronald D. Klein, and Charles B. Thomas. 1970, 13p

Descriptors: (*Small arms, Firing tests (Ordnance)), (*Firing tests (Ordnance), Effectiveness), Automatic weapons, Semiautomatic weapons, Kill probabilities, Performance (Human), Reaction kinetics, Gun sights, Cyclic rate, Decision making, Interactions.

The United States Army Infantry Board is currently conducting a 5-year Infantry Weapons Methodology Study. The aim of the methodology study is to provide test procedures and techniques which will insure the selection of the most effective weapons and equipment for the Infantry soldier. The approach of the methodology study was to cast these procedures in terms of the environment in which the candidate weapons and support equipment will be used. Since a realistic evaluation of weapon performance cannot be undertaken with validity in a sterile laboratory situation, the movement in recent years has been towards tactical or operational testing. This paper relates some of the results thus far achieved and emphasizes in particular a new analytical technique for isolating particularly important variables or measures of effectiveness. (Author)
AD-713 552 HC$3.00 MF$0.65

DEVELOPMENT OF A MATHEMATICAL MODEL FOR DESIGNING FUNCTIONAL CONTROLS OF A SOFT-RECOIL MECHANISM,
Army Weapons Command Rock Island Ill
Michael C. Nerdahl, and Jerry W. Frantz. 1970, 15p

Descriptors: (*Recoil mechanisms, Mathematical models), Equations of motion, Differential equations, Force (Mechanics), Orifices, Mathematical prediction, Ignition lag, Pressure, Breech mechanisms.
Identifiers: XM-46 recoil mechanisms, M-46 recoil mechanisms, Two degrees of freedom.

The report developes a mathematical model to aid in design of soft recoil mechanisms for large field artillery guns.

AD-713 565 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: HAND GRENADES.
Research By-Product,
George Washington Univ Alexandria Va Human Resources Research Office
Frank L. Brown. 20 Dec 68, 20p
Contract DA-44-188-ARO-2

Descriptors: (*Grenades, Army training), (*Combat surveillance, Army training), (*Infantry, Leadership), Warfare, Instruction manuals, Performance (Human).
Identifiers: *Infantry rifle squad leaders.

The paper presents the performances, knowledges, and skills required of the Infantry rifle squad leader to be technically and tactically proficient in the use of hand grenades under all levels of visibility and to insure increasingly effective use of hand grenades by his men. (Author)
AD-713 754 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: GRENADE LAUNCHER, 40MM, M79.
Research By-Product,
George Washington Univ Alexandria Va Human Resources Research Office
George J. Magner. Dec 68, 15p
Contract DA-44-188-ARO-2

Descriptors: (*Projectors (Ordnance), Army training), (*Combat surveillance, Army training), (*Infantry, Leadership), Ammunition, Safety, Maintenance, Military tactics, Warfare, Instruction manuals, Performance (Human).
Identifiers: *Infantry rifle squad leaders, *M-79 grenade launchers.

The paper outlines the knowledges, skills, and performances required of the Infantry rifle squad leader to use and supervise the use of the 40-mm, M79 Grenade Launcher. It presents information on the Grenade Launcher's capabilities, the delivery of accurate direct and indirect fire, the employment in tactical situations, safety procedures, maintenance, and destruction to prevent capture. (Author)
AD-713 756 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: RIFLE, 7.62-MM, M14A1.
Research By-Product,
George Washington Univ Alexandria Va Human Resources Research Office
Frank L. Brown. Dec 68, 35p
Contract DA-44-188-ARO-2

Descriptors: (*Rifles, Army training), (*Combat surveillance, Army training), (*Infantry, Leadership), Visibility, Maintenance, Loading (Ordnance projectors), Boresighting, Warfare, Instruction manuals.
Identifiers: M-14 guns (Cal .30), *Infantry rifle squad leaders.

The paper sets forth the knowledges, skills, and performances required of the Infantry rifle squad leader to use and supervise the use of the M14A1 rifle to deliver effective automatic and semiautomatic fire. (Author)
AD-713 793 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: ANTI-PERSONNEL MINE M18A1 (CLAYMORE).
Research By-Product,
George Washington Univ Alexandria Va Human Resources Research Office
Frank L. Brown. Dec 68, 29p
Contract DA-44-188-ARO-2

Descriptors: (*Weapons, Army training), (*Combat surveillance, Army training), (*Infantry, Leadership), Guns, Mines (Ordnance), Performance (Human), Warfare, Instruction manuals.
Identifiers: *Infantry rifle squad leaders, *Claymore weapons.

The paper describes the tactical and technical proficiency required of the Infantry rifle squad leader to inspect, pack, transport, site, install, fire, recover, maintain, and safeguard the Claymore as a controlled, one-shot weapon; to employ it as a mine or a boobytrap; and to supervise the employment of the weapon by his men. (Author)
AD-713 808 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: MACHINEGUN, 7.62-MM, M60.
Research By-Product,
George Washington Univ Alexandria Va Human Resources Research Office
Frank L. Brown. Aug 69, 64p
Contracts DA-44-188-ARO-2, DAHC19-69-C-0018

Descriptors: (*Machine guns, Army training), (*Combat surveillance, Army training), (*Infantry, Leadership), Performance (Human), Warfare, Instruction manuals.
Identifiers: *Infantry rifle squad leaders, M-60 guns (7.62 mm).

The paper sets forth the knowledges, skills, and performances required of the Infantry rifle squad leader to employ and supervise the usage of the M60 machinegun. (Author)
AD-713 811 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: RIFLE, 5.56MM, M16.
Research By-Product,
George Washington Univ Alexandria Va Human Resources Research Office
Henry E. Kelly, T. O. Jacobs, and Richard A. Taylor. Dec 68, 24p
Contract DA-44-188-ARO-2

Descriptors: (*Rifles, Army training), (*Combat surveillance, Army training), (*Infantry, Leadership), Performance (Human), Warfare, Instruction manuals.
Identifiers: *Infantry rifle squad leaders.

The paper covers the critical combat performances, knowledges, and skills required of the Infantry rifle squad leader when using and supervising the use of the M16 rifle as an automatic or semiautomatic weapon to include zeroing, firing positions, delivery of fire, rapid reloading, maintenance, immediate action, safety, and destruction. (Author)
AD-713 821 HC$3.00 MF$0.65

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: TECHNIQUE OF FIRE OF THE RIFLE SQUAD.
Research By-Product,
Human Resources Research Organization Alexandria Va
Henry E. Kelly. Oct 69, 56p
Contract DAHC19-70-C-0012

Descriptors: (*Ordnance, Army training), (*Combat surveillance, Army training), (*Infantry, Leadership), Performance (Human), Warfare, Instruction manuals.
Identifiers: *Infantry rifle squad leaders.

The performances, knowledges, skills, habits and attitudes covered in the paper are those the Infantry rifle squad leader must possess to train and lead in combat a rifle squad of the rifle platoon. Where the knowledge or skill in question is one which must be possessed by members of the rifle squad, it is assumed that the Infantry rifle squad leader is also qualified and motivated to train his squad to an acceptable standard of proficiency. (Author)
AD-713 824 HC$3.00 MF$0.65

19G. Rockets

CRITICAL COMBAT PERFORMANCES, KNOWLEDGES, AND SKILLS REQUIRED OF THE INFANTRY RIFLE SQUAD LEADER: ANTITANK WEAPON, 66-MM HEAT ROCKET, M72.
Research By-Product,
George Washington Univ Alexandria Va Human Resources Research Office
George J. Magner. Jan 69, 12p
Contract DA-44-188-ARO-2

Descriptors: (*Rockets, Army training), (*Combat surveillance, Army training), (*Infantry, Leadership), Antitank ammunition, Maintenance, Weapons, Warfare, Instruction manuals.
Identifiers: *Infantry rifle squad leaders.

The paper outlines the technical proficiency demanded of the Infantry rifle squad leader to prepare, fire, and maintain the light antitank weapons issued to his squad under all conditions of visibility. (Author)
AD-713 789 HC$3.00 MF$0.65

20. PHYSICS

20A. Acoustics

AN EXPERIMENTAL MODEL STUDY OF UNDERWATER ACOUSTIC SCATTERING FROM A WIND-DRIVEN SURFACE.
Doctoral thesis,
Naval Underwater Systems Center New London Conn New London Lab
F. John Kingsbury. 13 Aug 70, 371p Rept no. NUSC/NL-3021

Descriptors: (*Underwater sound, Scattering), (*Sonar signals, Scattering), Wind, Surfaces, Phase modulation, Mathematical prediction, Sound transmission, Underwater sound signals, Reflection, Doppler effect, Wind tunnels, Backscattering, Theses.
Identifiers: Underwater sound transmission, Surface waves.

The results of an experimental investigation into the characteristics of acoustic energy reflected from rough, time-varying surfaces are presented. Theory pertinent to the study of acoustic scattering is also presented to form a predictive base for the experimental work. The experimentally derived amplitude, slope, spectral, and spatial correlation characteristics of the rough surfaces are presented. Measurement results are shown which describe the spatial distribution characteristics of energy scattered from the rough surfaces. Experiments performed to determine the modulation effects imposed on the reflected acoustic energy by the time-varying surfaces are also presented. For all the measurements, the effects on the scattered energy characteristics of shadowing and changes in acoustic frequency, grazing angle, and the direction of acoustic propagation relative to the wave motion are discussed. (Author)
AD-713 068 HC$3.00 MF$0.65

APPLICATION OF CURRENT AUDITORY DAMAGE RISK CRITERIA TO AEROSPACE OPERATIONS.
Final rept. for Feb 67-Dec 69,
School of Aerospace Medicine Brooks AFB Tex
Donald C. Gasaway, and Harrell C. Sutherland. Sep 70, 27p* Rept no. SAM-TR-70-36

Descriptors: (*Noise, Hazards), (*Hearing, Damage), Auditory perception, Exposure, Broadband, Narrowband, Mathematical prediction, Medical research, Stress (Physiology).
Identifiers: *Hearing loss, Criteria, Evaluation, Intermittent noise, Noise pollution.

Valid and realistic criteria are needed for identifying and determining potentially hazardous noise encountered during ground and airborne aerospace operations. A set of criteria proposed by a working group on hearing, bioacoustics, and biomechanics, has been modified for easier interpretation and use in assessing auditory risk. An auditory risk calculator has been devised to simplify the task of assessing wide-band and narrow-band noise exposures. In addition, a simple chart has been prepared for use in evaluating intermittent noises. Examples of noise exposures encountered in aerospace operations are illustrated and applications of the three basic types of auditory risk criteria are demonstrated. Desirable and undesirable features of older and newer criteria are discussed. (Author)
AD-713 071 HC$3.00 MF$0.65

AN EXPANDED CHARACTERIZATION OF THE INFORMATION CAPACITY OF A SHORT RANGE UNDERWATER COMMUNICATIONS CHANNEL.
George Washington Univ Washington D C School of Engineering and Applied Science
For primary bibliographic entry see Field 17B.
AD-713 146 HC$3.00 MF$0.65

STUDY OF SOUND SCATTERING IN THE OCEAN.
Westinghouse Ocean Research Lab San Diego Calif
For primary bibliographic entry see Field 17A.
AD-713 238 HC$3.00 MF$0.65

MAGNETOSTRICTIVE GENERATION OF SURFACE ELASTIC WAVES,
California Univ Berkeley Dept of Electrical Engineering
F. W. Voltmer, R. M. White, and C. W. Turner. 28 Jul 69, 5p AROD-5718:7-E
Grants DA-ARO (D)-31-124-G1057, DA-ARO (D)-31-124-G949
Revision of report dated 21 Apr 69.
Availability: Pub. in Applied Physics Letters, v15 n5 p153-154, 1 Sep 69.

Descriptors: (*Ultrasonic radiation, Microwave frequency), (*Magnetostrictive elements, Design), Yttrium compounds, Iron compounds, Garnet, Transducers.
Identifiers: Surface waves, Yttrium iron garnets.

Surface elastic waves have been generated 60 MHz by magnetostrictive coupling in yttrium iron garnet (YIG). The transducers were evaporated aluminum meander lines. For a YIG plate with the (110) axis normal to the free surface and propagation along the (001) axis, maximum coupling occurred for the static field parallel to the direction of propagation. The effect of the internal magnetic field gradient on the transducer efficiency and the signal delay is discussed. (Author)
AD-713 245

GENERAL TREATMENT OF MODULATION SCANNING,
Admiralty Research Lab Teddington (England)
For primary bibliographic entry see Field 17A.
AD-713 278 HC$3.00 MF$0.65

NONLINEAR EFFECTS IN MICROWAVE ACOUSTIC LiNbO3 SURFACE WAVE DELAY LINES,
Air Force Cambridge Research Labs L G Hanscom Field Mass
A. J. Slobodnik, Jr. 8 Dec 69, 9p Rept no. AFCRL-70-0516
Availability: Pub. in The Jnl. of the Acoustical Society of America, v48 n1 pt2, p203-210 Jul 70.

Descriptors: (*Niobates, *Acoustics), Lithium compounds, Ultrasonic radiation, Microwave frequency, Surfaces, Harmonic generators, Lasers, Reflection.
Identifiers: *Lithium niobates, *Microwave acoustics.

Nonlinear effects were observed in LiNbO3 acoustic surface-wave delay lines operating at a fundamental frequency of 905 MHz. Second-, third-, and fourth-harmonic generation, and their buildup and subsequent decay with distance, have been measured using laser-light deflection. The acoustic power entering these harmonics can be made comparable to that in the fundamental, since surface-wave attenuation has been seen to be dependent on input power. In fact, under certain conditions harmonic power is returned to the fundamental causing a region of negative attenuation or 'gain.' Similar effects have been observed for the sum and difference frequencies (mixing) when two input frequencies are used. For linear operation at 905 MHz, surface-wave devices using Y-cut Z-propagating LiNbO3 should be limited to power densities of 10 mW/mm. (Author)
AD-713 304

MICROWAVE ACOUSTIC RESONANCES IN THIN PIEZOELECTRIC DISKS,
Air Force Cambridge Research Labs L G Hanscom Field Mass
Andrew J. Slobodnik, Jr. 13 Feb 70, 5p Rept no. AFCRL-70-0523
Availability: Pub. in IEEE Transactions on Sonics and Ultrasonics, vSU-17 n3 p196-199 Jul 70.

Descriptors: (*Piezoelectric crystals, *Resonators), (*Crystal oscillators, *Ultrasonic radiation), Quartz, Lithium compounds, Niobates, Transmission lines, Resonance.
Identifiers: *Microwave acoustics, Lithium niobates, Equivalent circuits.

High-overtone mode thickness-shear resonances in the range 2-3 GHz have been observed for the first time in Y-cut, AC-cut, and BC-cut quartz plates. High-overtone made thickness-dilatational resonances in X-cut quartz and Z-cut LiNbO3 plates have also been observed. These resonances are characterized using electromagnetic transmission-line techniques and the equivalent circuit for a thin piezoelectric disk vibrating in the gap of a reentrant cavity. (Author)
AD-713 325

DEPENDENCE OF SPATIAL AND TEMPORAL CORRELATION OF FORWARD-SCATTERED UNDERWATER SOUND ON THE SURFACE STATISTICS. I. THEORY. II. EXPERIMENT,
Wisconsin Univ Madison Geophysical and Polar Research Center
C. S. Clay, and H. Medwin. 9 Oct 69, 19p
Contract N00014-67-A-0128-0009
Availability: Pub. in The Jnl. of the Acoustical Society of America, v47 n5 pt2 p1412-1429 May 70.

Descriptors: (*Underwater sound, Scattering), Integrals, Partial differential equations, Statistical analysis, Hydrophones, Transmitter-receivers, Surfaces, Distribution functions, Wave functions.

The correlation of underwater sound forward scattered from a time-varying statistically rough surface has been studied for the low-roughness case. The surface was illuminated by a divergent sound beam. Directionality of the source and receivers was included in a surface-illumination function. As an alternative to solving the Fresnel integral, the illuminated area was divided into subareas, for which the plane-wave Helmholtz-Kirchhoff treatment was valid. The authors used the criterion that the wavefront sould be within lambda/8 of the

plane tangent to the wavefront over the subarea. The sound signals refelcted and scattered at each subarea were separated into coherent and incoherent components, and the coherent components from the subareas were added coherently. The covariance of signals observed at a pair of receivers was computed with the aid of the bivariate Gaussian distribution function. Computations of the sound scattered by a traveling roughness, such as a gravity wave, showed that the covariance of the signals scattered into the first receiver and later into a second receiver can be large at a time delay, which is related to the group velocity of the roughness. The temporal and spatial covariances were also computed for a surface roughness having a damped cosinusoidal dependence upon space and time. The main contributions to the modulations of the spatial or temporal covariances came from the sound that was scattered from the subareas in nonspecular directions. (Author)
AD-713 340

CALCULATING AND REDUCING NOISE GENERATED BY MARINE GAS TURBINE PLANTS (Raschet i Snizhenie Shuma Sudovykh Gazoturbinnykh Ustanovok),
Naval Intelligence Command Alexandria Va Translation Div
V. I. Zinchenko. 28 Sep 70, 59p Rept no. NIC-Trans-3117
Trans. of Tsentralnyi Nauchno-Issledovatelskii Institut Morskogo Flota. Trudy (USSR) n101 p3-60 1968.

Descriptors: (*Engine noise, Reduction), (*Internal combustion engine noise, Reduction), (*Marine engines, *Gas turbines), Sources, Intensity, Mathematical analysis, Compressor noise, USSR.
Identifiers: Translations.

Sources of marine engine noise, noise norms, and noise measurement are discussed.
AD-713 422 HC$3.00 MF$0.65

INVESTIGATION OF THE EFFECTIVENESS OF ULTRASONIC VIBRATIONS OF THE TOOL WHEN MACHINING HEAT-RESISTANT AND TITANIUM ALLOYS,
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 13H.
AD-713 455 HC$3.00 MF$0.65

SOME INFORMATION PROCESSES FOR ARRAYS OF SENSORS.
Naval Research Lab Washington D C
For primary bibliographic entry see Field 17A.
AD-713 456 HC$3.00 MF$0.65

SERIES EXPANSION FOR THE SOUND FIELD AT A CAUSTIC.
Technical rept.,
Cambridge Acoustical Associates Inc Mass
David A. Sachs. Sep 70, 48p Rept no. CAA-U-363-222
Contract N00014-70-C-0080

Descriptors: (*Sound transmission, Focusing), (*Sound signals, Boundary layer), Asymptotic series, Harmonic analysis.

Higher order terms in a series expansion of the sound field in the vicinity of a caustic are given. The results are applicable to a caustic zone in an arbitrarily stratified medium at which sound energy from a time-harmonic point source is focused. The higher order terms can be used either to extend the domain of applicability of the lower order terms or to provide a measure of their accuracy. (AUTHOR)
AD-713 597 HC$3.00 MF$0.65

PRECURSOR WAVES FROM A CONTINUOUS TRANSITION LAYER IN THE SOUND SPEED PROFILE.
Technical rept.,
Cambridge Acoustical Associates Inc Mass
David A. Sachs. Aug 70, 47p Rept no. CAA-U-361-222
Contract N00014-70-C-0080

Descriptors: (*Sound transmission, Underwater explosions), Boundary layer transition, Fourier analysis, High frequency, Harmonic analysis, Integral transforms, Underwater sound.
Identifiers: Precursor effect, Fourier transformation.

If a sound speed profile exhibits a relatively abrupt transition between two more or less uniform regions of differing sound speeds, it is often observed that among the signals produced by a distant sound source is one which arrives earlier than all others. This type of signal, which has been variously referred to as the precursor wave, the lateral wave or the head wave, is not explainable on the basis of ray acoustics. In the past, theoretical investigations have been made of the formation of precursors on both sharply abrupt and continuous transition layers. Following the methods of Lang, the author considers the precursors arising from a point sound source located in a homogeneous half-space connected to another isovelocity domain of higher sound speed through a transition zone in which the square of the index of refraction is a linear function of height. High frequency asymptotic expressions for the precursor pressures are developed for both the transition zone and the half-space in which the sound source is located. By means of Fourier transformation, the treatment is extended to include transient sound sources. (Author)
AD-713 601 HC$3.00 MF$0.65

OBSERVATION OF CO2 LASER INDUCED ACOUSTICAL WAVES IN CO2,
Army Electronics Command Fort Monmouth N J Inst for Exploratory Research
Hermann W. Brinkschulte. 11 Dec 69, 5p
Revision of report dated 22 Sep 69.
Availability: Pub. in Jnl. of Applied Physics, v41 n6 p2298-2302 May 70.

Descriptors: (*Sound transmission, *Carbon dioxide), (*Gas lasers, Heating), Light pulses, Sound, Absorption.
Identifiers: Carbon dioxide lasers.

Acoustical waves have been observed in CO2, at initial pressures between 2 and 25 Torr, caused by sudden heating from incident CO2 laser pulses. The effect was observed by monitoring the temperature increase of the window of the absorption cell due to the incident sound wave. Results indicate that the influence of a high-power laser beam upon the penetrated atmosphere--and the feedback of the disturbed atmosphere on the propagation of the laser beam--may be conveniently studied under simulated laboratory conditions. (Author)
AD-713 746

SPEECH SPECTROGRAMS USING THE FAST FOURIER TRANSFORM,
Massachusetts Inst of Tech Cambridge
For primary bibliographic entry see Field 17B.
AD-713 751

ON THE ACOUSTIC CONDUCTANCE OF THE BURNING SURFACE OF POWDER (Obakusticheskoi Provodimosti Goryashchei Poverkhrosti Porokha),
Army Foreign Science and Technology Center Washington D C
S. S. Novikov, Yu. S. Ryazantsev, and V. E. Tulskikh. 28 Sep 70, 10p Rept no. FSTC-HT-23-1005-70
Trans. of Zhurnal Prikladnoi Mekhaniki i Technicheskoi Fiziki (USSR) n5 p29-32 1969.

Descriptors: (*Burning rate, *Acoustic properties), (*Solid rocket propellants, *Rocket motor noise), Mathematical analysis, USSR.
Identifiers: Translations, *Combustion stability.

The origination of acoustic instability of burning in solid fuel rocket engines is associated with the possibility of amplifying the sound waves during reflections from the burning surface of solid fuel. In the case of a ballistic powder, it is possible to derive an analytical formula and numerical values for acoustic conductance relying on completely specific experimental values for all parameters figuring in the basic equations. Given are the results of such calculations. (Author)
AD-713 753 HC$3.00 MF$0.65

NOISE WITHIN THE BELL UH-1P HELICOPTER DURING FLIGHT.
Final rept. Apr-Jun 70,
School of Aerospace Medicine Brooks AFB Tex
Donald C. Gasaway. Sep 70, 15p Rept no. SAM-TR-70-57

Descriptors: (*Noise, *Aviation medicine), (*Combat noise, Measurement), Machine guns, Aircraft guns, Rockets, Auditory perception, Helicopters, Flight.
Identifiers: UH-1P aircraft, H-1 aircraft, Miniguns.

Measurements are reported for acoustic noise encountered within a Bell UH-1P helicopter during a ground-attack mission. Auditory effects of rocket and gun (7.62-mm. minigun) firing are described and illustrated. Factors of aeromedical importance are identified and described. (Author)
AD-713 830 HC$3.00 MF$0.65

PHYSICAL PROPERTIES OF THE CHOLESTERIC MESOPHASE.
Kent State Univ., Ohio. Liquid Crystal Inst.
For primary bibliographic entry see Field 7D.
AD-848 719 HC$3.00 MF$0.65

PHYSICAL PROPERTIES OF THE CHOLESTERIC MESOPHASE.
Kent State Univ., Ohio. Liquid Crystal Inst.
For primary bibliographic entry see Field 7D.
AD-872 377 HC$3.00 MF$0.65

CONTRIBUTION TO THE DECAY THEORY OF UNSTABLE QUANTUM SYSTEMS.
International Centre for Theoretical Physics, Trieste (Italy).
L. Fonda, and G. C. Ghirardi. Jan 70, 18p IC/70/4 Subm- Submitted for Publication Spon- Sponsored in Part By Ist. Nazl. Di Fis. Nucl.

Descriptors: *Decay, *Nuclear scattering, *Quantum mechanics, *Wave functions, Elastic scattering, Potential theory, S matrix theory, Scattering amplitude.

For abstract, see STAR 08 21.
N70-38733 HC$3.00 MF$0.65

EFFECT OF RAIN ON UNDERWATER NOISE LEVEL.
Saclant ASW Research Center, La Spezia (Italy).
N. Bom. 15 Sep 68, 33p SACLANTCEN-TR-121

Descriptors: *Noise spectra, *Rain, *Sound pressure, *Underwater acoustics, Lakes, Noise intensity, Very low frequencies.

For abstract, see STAR 08 21.
N70-38737 HC$3.00 MF$0.65

AIRCRAFT ENGINE NOISE AND SONIC BOOM TECHNICAL EVALUATION REPORT ON AGARD SPECIALISTS' MEETING.
Advisory Group for Aeronautical Research and Development, Paris (France). Advisory Group for

Aerospace Research and Development, Paris (France).
M. Pianko, and J. O. Powers. Jun 70, 8p AGARD-AR-26-70

Descriptors: *Jet aircraft noise, *Noise reduction, *Sonic booms, Acoustic ducts, Compressors, Conferences, Receivers, Sound transmission, Turbofans.

For abstract, see STAR 08 21.
N70-38782 HC$3.00 MF$0.65

USE OF OPTICAL TRANSFORMS FOR ANALYSIS OF ACOUSTIC AND SEISMIC DATA,
Sandia Labs., Albuquerque, N. Mex.
For primary bibliographic entry see Field 8K.
For abstract, see NSA 24 20.
SC-DR-70-206 HC$3.00 MF$0.65

20B. Crystallography

DEVELOPMENT OF TECHNIQUES FOR PREPARING HIGH-PURITY SINGLE-CRYSTAL GALLIUM PHOSPHIDE AND ALLOYS OF GALLIUM PHOSPHIDE AND INDIUM PHOSPHIDE.
Final rept. 15 Jul 59-15 Jul 61,
Massachusetts Inst of Tech Lexington Lincoln Lab
J. F. Miller, R. T. Bate, H. C. Gorton, R. C. Himes, and H. L. Goering. 15 Jul 61, 27p ESD-TR-70-246
Contract AF 19 (604)-5200
Prepared in cooperation with Battelle Memorial Inst., Columbus, Ohio.

Descriptors: (*Crystal growth, *Phosphides), (*Single crystals, Purification), Zone melting, Laboratory equipment, Test methods, Electrical properties, Optical properties, Semiconductors.
Identifiers: *Gallium phosphides, *Indium phosphides, Bridgmann method, Czochralski method, Solute buildup method.

The report describes the work accomplished on the development of techniques for preparing high-purity single crystal gallium phosphide and alloys of gallium phosphide and indium phosphide and covers the period from 15 July 1959 through 15 July 1961. It was found that the melting points and dissociation pressures of GaP and GaP-InP alloys are high (up to approximately 1510 C and 35 atmospheres, respectively). To crystallize the materials from stoichiometric melts, it is necessary to work simultaneously at elevated temperatures and pressures. Since temperature and pressure requirements for growth of crystals from solution are much less severe, the development of such methods is desirable. In the research, emphasis has been placed on development of methods for crystallizing GaP and GaP-InP alloys from metal rich solutions. (Author)
AD-713 137 HC$3.00 MF$0.65

PHOTOCONDUCTIVE AND PHOTOVOLTAIC EFFECTS IN DIBENZOTHIOPHENE AND ITS MOLECULAR COMPLEXES,
Air Force Cambridge Research Labs L G Hanscom Field Mass
For primary bibliographic entry see Field 7D.
AD-713 205

ON THE DESCRIPTION OF CRYSTAL DEFECTS BY POINT FORCE ARRAYS.
Technical rept.,
Florida Univ Gainesville Dept of Engineering Science and Mechanics
Craig S. Hartley. 9 Oct 70, 30p Rept no. TR-4
Contract N00014-68-A-0173-0002

Descriptors: (*Crystal lattice defects, Mathematical analysis), Atomic structure, Mathematical models, Continuum mechanics, Crystal structure.
Identifiers: Screw dislocations, Point defects.

A modification to the continuum theory of crystal defects is described in which the interatomic reaction forces developed when a defect is introduced are replaced by point forces in a continuum. The location of the forces is determined by the atomic positions surrounding the defect, and the magnitudes by the requirement that the force array produce the proper displacement field for the defect. The technique is applied to the construction of primitive prismatic and shear dislocation loops and a vacancy in a hypothetical isotropic, simple cubic lattice. A screw dislocation is formed from an array of shear loops and the displacement field, width and self-energy is calculated. The construction employed eliminates the singular behavior of the self-energy at the dislocation core and results in a wider dislocation than the Peierls model. Applications of the model to other dislocation configurations are suggested. (Author)
AD-713 214 HC$3.00 MF$0.65

ORIENTED EUTECTIC MICROSTRUCTURES IN THE SYSTEM Al2O3/ZrO2,
Army Materials and Mechanics Research Center Watertown Mass
For primary bibliographic entry see Field 11B.
AD-713 336

DIRECT SOLUTION OF COMPLEX CRYSTAL STRUCTURES BY ELECTRON MICROSCOPY,
Army Electronics Command Fort Monmouth N J Inst for Exploratory Research
Jack A. Kohn, Charles F. Cook, Jr., and Donald W. Eckart. 1970, 14p

Descriptors: (*Etched crystals, *Electron microscopy), (*Ferrites, *Crystal structure), Etching, Test methods, Microwave equipment.

Hexagonal ferrites, complex ferrimagnetic oxides having exploitable microwave/millimeter-wave properties, form structures too large and complex for solution by classical diffraction techniques. Determination of crystal structures, however, is essential for a structural understanding of properties and for attaining the ultimate objective of tailor-made materials in thi frequency range. The procedure described herein uses high-resolution replica electron microscopy to 'read out' structural stacking sequences 'encoded' onto hexagonal ferrite crystal surfaces by hydrochloric and, particularly, nitric acid etching. The method readily permits the direct solution of such crystal structures, including materials with larger unit cells than in any known inorganic substances. (Author)
AD-713 554 HC$3.00 MF$0.65

STRUCTURE AND LATTICE DYNAMICS OF METAL AZIDES AND THEIR RELATIONSHIP TO STABILITY,
Picatinny Arsenal Dover N J Feltman Research Labs
Samuel F. Trevino, Chang S. Choi, Zafar Iqbal, Richard D. Mical, and Henry J. Prask. 1970, 15p

Descriptors: (*Explosive materials, Crystal structure), (*Azides, *Crystal structure), (*Raman spectroscopy, Azides), (*Spectra (Infrared), Azides), Crystal lattices, Detonations, Vibration.
Identifiers: *Barium azides.

Earlier research attempted to relate the low frequency molecular motions in solid explosives to the ease of initiation of detonation. However, in order to obtain a detailed and quantitative physical picture it was necessary to have more complete information on the crystal structures of the explosives, and to develop and apply improved techniques to resolve the spectra of molecular motions in crystals. The paper, dealing with the structure and lattice or molecular dynamics of inorganic azides at room temperature, presents one facet of the program which has yielded significant advances in technique and in our understanding of explosives stability. (Author)
AD-713 585 HC$3.00 MF$0.65

CRYSTAL PROPERTIES AS INFLUENCED BY CRYSTALLOGRAPHIC IMPERFECTIONS: HIGH-ENERGY ION IMPLANTATION,
International Business Machines Corp Hopewell Junction N Y East Fishkill Lab
Guenter H. Schwuttke. 1 Jul 70, 119p Rept no. Scientific-2 AFCRL-70-0459
Contract F19628-68-C-0196

Descriptors: (*Crystal lattice defects, Radiation damage), (*Ion bombardment, *Silicon), (*Semiconductors, Doping), Electron microscopy, Annealing, X-ray diffraction analysis, Silicon compounds, Nitrides, Oxides.
Identifiers: *Ion implantation, Silicon nitrides.

High-energy ion implantation and its use for the formation of insulating films is evaluated. Subsurface silicon nitride, silicon carbide, and silicon oxide films are produced approximately 2 micrometers below the silicon surface. The perfection of the silicon crystal above and below the insulating film is maintained. The films are homogeneous, self-supporting, and 5000A thick for moderate-beam currents. Thermal spiking, leading to nonuniform films, is observed for high-beam currents (20 microamps) and short-time implantations. Spiking can be avoided at low-beam currents. High-resistivity surface layers on silicon are produced through proton implantation. For 1MeV protons and a dose larger than 10 to the 15th power H (+)/sq cm, the high-resistivity layer is 16 micrometers thick. For 3MeV this layer is about 90 micrometers. The crystallographic perfection of the silicon in this surface layer is maintained. For long-time anneal cycles up to 300C the high resistivity layer is stable. Short-time anneal cycles at 400C change the resistance of the layer only slightly. At higher anneal temperatures the radiation damage starts to anneal out rapidly, and at 800C the crystal returns to its original resistivity. (Author)
AD-713 671 HC$3.00 MF$0.65

SURFACE MORPHOLOGY OF SUBLIMATED CRYSTALS OF CADMIUM AND ZINC SULFIDES,
Ohio State Univ Research Foundation Columbus
Z. A. Munir, and J. P. Hirth. 15 Jan 70, 10p Rept no. OSURF-2966-TR-1
Contracts N00014-67-A-0232-0005, Nonr-495 (26)
Prepared in cooperation with San Jose State Coll., Calif. Dept. of Materials Science.
Availability: Pub. in Jnl. of Applied Physics, v41 n6 p2697-2704 May 70.

Descriptors: (*Crystal growth, *Sublimation), (*Cadmium sulfides, Surface properties), (*Zinc sulfides, Surface properties), Single crystals, Semiconductors, Etched crystals, Dislocations.

The surface structure of (0001)- and (10 (-1)0)-oriented single crystals of ZnS and CdS sublimated under controlled variable vapor pressure was investigated. The results were found to be consistent with the terrace-ledge-kink model of sublimation. Possible revisions to the theory of the effect of charged carrier concentration on sublimation of II-VI compounds are suggested. (Author)
AD-713 837

SUPERCONDUCTING TRANSITION TEMPERATURES AND LATTICE PARAMETERS OF SIMPLE-CUBIC METASTABLE Te-Au SOLID SOLUTIONS CONTAINING Fe AND Mn.
California Inst. of Tech., Pasadena. W. M. Keck Lab. of Engineering Materials.
For primary bibliographic entry see Field 20C.
For abstract, see NSA 24 20.
CALT-822-9 HC$3.00 MF$0.65

THE TRANSITION PHASE IN TiNi,
Case Western Reserve Univ., Cleveland, Ohio. Div. of Metallurgy and Materials Science.
G. D. Sandrock, and R. F. Hehemann. 31 Jul 70, 61p
Contract AT (11-1)-588

Descriptors: (*Crystal structure, *Phase transformations), Titanium alloys, Nickel alloys.

For abstract, see NSA 24 20.
COO-588-19 HC$3.00 MF$0.65

MEASUREMENTS OF PREFERRED ORIENTATION IN BERYLLIUM FOILS.
Technical rept.,
EG and G, Inc., Las Vegas, Nev.
Leif V. Singman. 1 Apr 70, 31p TR-L-986

Descriptors: (*Preferred orientation, *Beryllium), (*Crystal structure, Orientation), Crystal symmetry, Metal foils, X ray diffraction, Electron distribution.

For abstract, see NSA 24 20.
EGG-1183-1476 HC$3.00 MF$0.65

TERNARY OXIDES OF Np (IV) AND Am (III) WITH Mo OR W: NpM2O8, Am2M3O12 (M EQUALS Mo, W),
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 7D.
For abstract, see NSA 24 20.
ORNL-tr-2363 HC$3.00 MF$0.65

CRYSTALLINE STRUCTURE OF HIGH TEMPERATURE SILVER IODIDE alpha-AgI,
Oak Ridge National Lab., Tenn.
Lester W. Strock. Aug 70, 17p
Trans. of Zeitschrift fuer Physikalische Chemie, Leipzig (East Germany) v25B p441-459 1934, by R. Gregg Mansfield.

Descriptors: (*Silver iodide, *Crystal structure), Transition temperature, East Germany, Translations.

For abstract, see NSA 24 20.
ORNL-TR-2374 HC$3.00 MF$0.65

STANDARD X-RAY DIFFRACTION POWDER PATTERNS,
National Bureau of Standards, Washington, D.C.
H. E. Swanson, H. F. McMurdie, M. C. Morris, and E. H. Evans. Sep 70, 174p* NBS-Mono-25-Sec-8
See also NBS-Mono-25-Sec-7. Paper copy also available from Superintendent of Documents, GPO, Washington, D.C. 20402. $1.50 as C13.44:25/Sec. 8.

Descriptors: (*Crystal structure, Determination), (*X ray diffraction, Tables (Data)), Lattice parameters, X ray analysis, Intensity, Standards.
Identifiers: *Diffraction patterns.

Standard x-ray diffraction patterns are presented for 81 substances. Fifty-three of these patterns represent experimental data and 28 are calculated. The experimental x-ray powder diffraction patterns were obtained with an x-ray diffractometer, using samples of high purity. All d-values were assigned Miller indices determined by comparison with computed interplanar spacings consistent with space group extinctions. The densities and lattice constants were calculated, and the refractive indices were measured whenever possible. The calculated x-ray power diffraction patterns were computed from published crystal structure data. Both peak height and integrated intensities were reported for the calculated patterns. (Author)
PB-194 872 HC$1.50 MF$0.65

DYNAMICAL THEORY OF KIKUCHI ELECTRONS,
California Univ., Berkeley. Lawrence Radiation Lab.
For primary bibliographic entry see Field 14B.
For abstract, see NSA 24 20.
UCRL-19631 HC$3.00 MF$0.65

X-RAY STRUCTURE INVESTIGATION OF SOME SUBSTITUTED INDOLES, AND THE X-RAY CRYSTAL OF 1, 1'-BISHOMOCUBANE.
Doctoral thesis,
California Univ., Berkeley. Lawrence Radiation Lab.
William G. Quarles. May 70, 173p
Contract W-7405-eng-48

Descriptors: (*Polycyclic compounds, *Crystal structure), (*Amphetamines, Crystal structure), (*Indoles, Crystal structure), X ray diffraction analysis, Benzoates, Theses.
Identifiers: *Methoxytryptamine, *Pentacyclo (4-4-0-0 (2-5)-0 (3-8)-0 (4-8))decanes, *Melatonin, *Indole/aminoethyl.

For abstract, see NSA 24 20.
UCRL-19906 HC$3.00 MF$0.65

PHASE TRANSFORMATIONS IN THE ACTINIDES,
California Univ., Livermore. Lawrence Radiation Lab.
For primary bibliographic entry see Field 11F.
For abstract, see NSA 24 20.
UCRL-72557 HC$3.00 MF$0.65

DISLOCATIONS IN CUBIC URANIUM OXIDES,
Bettis Atomic Power Lab., Pittsburgh, Pa.
H. Blank, and C. Ronchi. 1970, 22p
Trans. of Journal of Nuclear Materials (Netherlands) v31 p1-12 1969.

Descriptors: (*Uranium oxides, *Crystal dislocations), Translations, West Germany.

For abstract, see NSA 24 20.
WAPD-Trans-131 HC$3.00 MF$0.65

20C. Electricity and Magnetism

SELECTED PAPERS PRESENTED AT THE HIGH-PRESSURE ARC SYMPOSIUM SPONSORED BY THE AMERICAN PHYSICAL SOCIETY ON 28 AND 29 OCTOBER 1969.
Aerospace Research Labs Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 20I.
AD-713 131 HC$3.00 MF$0.65

SPIN INTERACTIONS IN Cu (NO3)2.2.5H2O.
Carnegie-Mellon Univ Pittsburgh Pa Dept of Physics
For primary bibliographic entry see Field 20L.
AD-713 133 HC$3.00 MF$0.65

DIAMAGNETISM DUE TO FLUCTUATIONS IN SUPERCONDUCTORS.
Technical rept.,
Harvard Univ Cambridge Mass Div of Engineering and Applied Physics
Jerry P. Gollub. Sep 70, 193p Rept no. TR-3
Contracts N00014-67-A-0298-0022, SD-88
Sponsored in part by Grant NSF-GP-11392.

Descriptors: (*Superconductors, Magnetic properties), Transition temperature, Magnetometers, Thallium alloys, Lead alloys, Lead, Indium.
Identifiers: *Diamagnetism, Order parameters, Ginzburg-Landau theory, SQUID (Superconducting Quantum Interference Devices), Superconducting quantum interference devices.

Fluctuations of the order parameter above T sub c in superconductors give rise to a small diamagnetism, comparable in magnitude to the Landau diamagnetism. An extremely sensitive magnetometer system was devised to measure this small temperature-dependent diamagnetism. A superconducting quantum interference device coupled to the sample was used as a magnetic flux detector. The sample temperature could be varied continusously between 2 K and 16 K while magnetization changes as small as 10 to the - 8th power gauss were resolved. Extensive measurements have been performed on bulk single crystals of three materials: indium, lead, and type II lead-thallium alloys. Each of these materials shows a temperature-dependent diamagnetism which is qualitatively described by Prange's calculation for small applied fields. Results are discussed.
AD-713 242 HC$3.00 MF$0.65

PHOTOCONDUCTIVITY AND OPTICAL PROPERTIES OF AMORPHOUS GeTe,
IBM Watson Research Center Yorktown Heights N Y
For primary bibliographic entry see Field 20L.
AD-713 249

CONTACT-POTENTIAL CHANGES PRODUCED ON METAL SURFACES BY TENSILE STRESSES,
Virginia Univ Charlottesville Dept of Physics
S. H. French, and J. W. Beams. 17 Oct 69, 7p
AROD-4036:5-MC
Grant DA-ARO (D)-31-124-G996
Availability: Pub. in Physical Review B, v1 n8 p3300-3303, 15 Apr 70.

Descriptors: (*Voltage, Surfaces), Tensile properties, Stresses, Copper, Alloys, Oxides.
Identifiers: *Contact potentials.

Contact-potential changes produced by applied tensile stresses on a number of metal surfaces have been measured. Except at very low tensile stresses, where the results are uncertain, it is found that in the elastic region of the metal, the contact potential becomes increasingly negative with increase of tensile stress. In the plastic region of the metal, the contact potential changes sign and increases in the positive direction until rupture occurs. The experiments were carried out in an atmosphere of nitrogen. (Author)
AD-713 251

SOLUTIONS OF THE EINSTEIN AND EINSTEIN-MAXWELL EQUATIONS,
Texas Univ Austin
For primary bibliographic entry see Field 20J.
AD-713 313

DIELECTRIC FIELD COMPUTATIONS IN SEMICONDUCTOR OXIDE INTEGRATED CIRCUITS.
Cullen Coll of Engineering Houston Tex
For primary bibliographic entry see Field 9E.
AD-713 476 HC$3.00 MF$0.65

TESTING FOR AN ORGANIC SUPERCONDUCTOR,
Army Mobility Equipment Research and Development Center Fort Belvoir Va
Forrest J. Agee, Jr., and Glenn E. Spangler. 1970, 13p

Descriptors: (*Superconductors, *Organic compounds), Test methods, Dyes, Aromatic compounds, Polymers, Magnetic properties, Cryogenics.
Identifiers: Diamagnetism, *Meissner effect.

A very brief review is given of some of the theories on semiconducting polymers before describing new observations on the magnetic susceptibility of various dyes, sugars, aromatics, and polymers which were undertaken to test for any unusual diamagnetism indicating a Meissner effect. No superconductive properties were found.
AD-713 501 HC$3.00 MF$0.65

ECHO AMPLIFICATION IN MAGNETIC MATERIALS WITH APPLICATION TO PULSE COMPRESSION RADAR,
Army Missile Command Redstone Arsenal Ala Physical Sciences Lab

A. C. Daniel, B. D. Guenther, and C. R. Christensen. 1970, 15p

Descriptors: (*Magnetic resonance, Reviews), (*Radar signals, Pulse compression), (*Radar receivers, Feasibility studies), Yttrium compounds, Iron compounds, Garnet, Ferrites, Relaxation time, Nuclear magnetic resonance, Nonlinear systems, Cryogenics.
Identifiers: *Spin echoes, Yttrium iron garnets.

Echo phenomena in several materials have been reviewed for the purpose of considering the recently proposed amplified spin echo as a chirp radar receiver. The technique is believed to exhibit considerable merit in that a number of desirable characteristics have been combined in a unique manner. If properly realized, a portion of the processing of the radar signal could be accomplished at the antenna feed element. However, the available materials still limit the practical usefulness of this device as compared to more conventional techniques. (Author)
AD-713 518 HC$3.00 MF$0.65

EXPERIMENTAL SUPERCONDUCTING ALTERNATORS WITH IRON-CORE AND IRON-FREE ARMATURES,
Army Mobility Equipment Research and Development Center Fort Belvoir Va
For primary bibliographic entry see Field 10B.
AD-713 523 HC$3.00 MF$0.65

SUPERCONDUCTING TRANSITION TEMPERATURES AND LATTICE PARAMETERS OF SIMPLE-CUBIC METASTABLE Te-Au SOLID SOLUTIONS CONTAINING Fe AND Mn.
California Inst. of Tech., Pasadena. W. M. Keck Lab. of Engineering Materials.
L. R. Newkirk, and C. C. Tsuei. Aug 70, 25p
Contract AT (04-3)-822

Descriptors: (*Superconductors, Transition temperatures), (*Solid solutions, *Lattice parameters), Iron containing alloys, Gold containing alloys, Tellurium containing alloys, Impurities, Magnetoresistivity, Simple cubic lattices.
Identifiers: Magnetic impurities.

For abstract, see NSA 24 20.
CALT-822-9 HC$3.00 MF$0.65

OBSERVATIONS ON THE CUPROUS SULFIDE LAYER ON SINGLE CRYSTAL CADMIUM SULFIDE.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
J. Singer. Sep 70, 13p NASA-TM-X-2073, E-5727
Contract 120-33

Descriptors: *Cadmium sulfides, *Copper sulfides, *Single crystals, *Surface layers, Chemical reactions, Electron microscopes, Ionic reactions, Photovoltaic cells, Surface defects.

For abstract, see STAR 08 21.
N70-38489 HC$3.00 MF$0.65

ELECTRIC IMPEDANCE CALCULATION FOR MULTIPHASE RECTANGULAR CONDUCTOR SYSTEMS BY ANALOG METHOD.
Berechnung Der Stromverdraengung in Mehrphasigen Rechteckleiter-systemen Mit Hilfe Eines Analogieverfahrens
Eidgenossische Technische Hochschule, Zurich (Switzerland).
H.-J. Sigg. 1969, 129p DISS-4219
Lang- in German, English Summary

Descriptors: *Analog simulation, *Electric conductors, *Electrical impedance, *Multipath transmission, Approximation, Rectangles.

For abstract, see STAR 08 21.
N70-38759 HC$3.00 MF$0.65

METHOD FOR MEASURING MAGNETIC SURFACES USING A DIELECTRIC GRID.
Princeton Univ., N. J. Transtek Associates, Reading, Mass.
A. P. Popryadukhin. Apr 70, 14p MATT-TRANS-101
Contract AT/30-1/-1238
Tran- Transl. Into English From Akad. Nauk Sssr Preprint No. 108 Lang- in Russian and English Prep- Prepared for Princeton Univ.

Descriptors: *Coordinates, *Dielectrics, *Harmonics, *Magnetic fields, Amplitudes, Graphs (charts), Resonant frequencies, Surface properties.

For abstract, see STAR 08 21.
N70-38826 HC$3.00 MF$0.65

BIBLIOGRAPHY OF MAGNETIC MATERIALS AND TABULATION OF MAGNETIC TRANSITION TEMPERATURES,
Oak Ridge National Lab., Tenn.
T. F. Connolly, and Emily D. Copenhaver. Jul 70, 116p*
Contract W-7405-eng-26

Descriptors: (*Magnetic materials, Transition temperature), Curie temperature, Neel temperature, Bibliographies, Tables (Data).

For abstract, see NSA 24 20.
ORNL-RMIC-7 (Rev.2) HC$3.00 MF$0.65

REPORT OF NRL PROGRESS.
Naval Research Lab., Washington, D.C.
For primary bibliographic entry see Field 14B.
PB-195 154 HC$3.00 MF$0.65

MEASURED TIME AND FREQUENCY RESPONSE OF A MINIATURE SUPERCONDUCTING COAXIAL LINE,
California Univ., Livermore. Lawrence Radiation Lab.
N. S. Nahman, M. P. Ekstron, and W. D. McCaa, Jr. 15 Jun 70, 30p CONF-700618-1
Presented at the Applied Superconductivity Conference, Boulder, Colo. Jun 70.

Descriptors: (*Coaxial cables, *Superconductivity), Frequency response, Time measurement, Cryogenics, Attenuation.

For abstract, see NSA 24 20.
UCRL-72574 HC$3.00 MF$0.65

20D. Fluid Mechanics

AN INTEGRAL EQUATION FOR UNSTEADY SURFACE WAVES AND A COMMENT ON THE BOUSSINESQ EQUATION.
Technical rept.,
California Univ Berkeley Div of Aeronautical Sciences
John G. B. Byatt-Smith. Jun 70, 24p Rept no. AS-70-7
Contract N00014-69-A-0200-1020

Descriptors: (*Fluid flow, *Integral equations), Incompressible flow, Water waves.
Identifiers: Surface waves, Inviscid flow, Boussinesq equations, Unsteady flow.

An exact integral equation for unsteady inviscid surface waves is derived. Existing known approximations are all derived from the one equation. The Boussinesq equation is obtained and criticized. (Author)
AD-713 107 HC$3.00 MF$0.65

INTERACTION OF A SPHERICAL SOURCE FLOW WITH A RAREFIED ATMOSPHERE.
Technical rept.,
Purdue Univ Lafayette Ind Project Squid Headquarters
J. W. Brook, and B. B. Hamel. Sep 70, 14p Rept no. SQUID-TR-CCNY-1-PU
Contract N00014-67-A-0226-0005
Prepared in cooperation with City Coll., New York, and Grumman Aerospace Corp., Bethpage, N. Y.

Descriptors: (*Jet mixing flow, *Superaerodynamics), Interactions, Hypersonic flow, Exhaust gases, Nozzle gas flow, Atmosphere, Sources.
Identifiers: Squid project.

The interaction of a hypersonic spherical source flow with a rarefied background is solved using a model Boltzmann equation employing a three fluid description. Matched asymptotic expansions of the variables in inner (background scattering) and outer (jet scattering) regions are employed and the zeroth order composite solution found. (Author)
AD-713 122 HC$3.00 MF$0.65

DESCRIPTION OF A NOZZLE TEST FACILITY.
Aerospace Research Labs Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 14B.
AD-713 130 HC$3.00 MF$0.65

ANALYSIS OF SLAMMING DATA FROM THE 'S.S. WOLVERINE STATE'.
Teledyne Materials Research Co Waltham Mass
For primary bibliographic entry see Field 13J.
AD-713 196 HC$3.00 MF$0.65

TAETIGKEITSBERICHTE 1969. FAHGEBIET 1: STROEMUNGSMECHANIK (Activity Report 1969. Division 1: Fluid Mechanics),
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Porz-Wahn (West Germany)
Hermann Schlichting, Wilhelm Riegels, Alfred Heyser, Klaus Oswatitsch, and Henry Goertler. 1969, 89p
Text in German.
Availability: Pub. in Deutsche Forschungs- und Versuchsanstalt fuer Luftund Raumfahrt-Jahresbericht 1969 89p. No copies furnished.

Descriptors: (*Fluid mechanics, Scientific research), Aerodynamics, Gas flow, Theory, Mathematics, Turbulence, West Germany.

Der Inhalt: Institut fur Aerodynamik; (AVA)-Abteilung Aerodynamik; (AVA)-Abteilung Gasdynamik; (AVA)-Abteilung Raumfahrtaerodynamik; Institut fur Angewandte Gasdynamik; Institut fur Theoretische Gasdynamik; Institut fur Angewandte Mathematik und Mechanik; Institut fur Turbulenzforschung.
AD-713 207

POLYELECTROLYTES IN SOLUTION - THEIR CONFORMATION AND TURBULENT FLOW CHARACTERISTICS.
Doctoral thesis digest,
Massachusetts Inst of Tech Cambridge Dept of Chemical Engineering
William B. Clarke. 2 Oct 70, 29p
Contract Nonr-3963 (10)

Descriptors: (*Polymers, *Drag), Stereochemistry, Skin friction, Fluid flow, Turbulence, Salts, Solutions, Theses.
Identifiers: *Drag reducing polymers, Drag reducing fluids, *Polyelectrolytes, Polyacrylamides, *Molecular conformations.

A slightly ionic and a highly ionic polymer of molecular weights about 8000000 were studied in dilute solution. The molecular conformation was studied by intrinsic viscosity and light scattering to find the molecular weight and radius of gyration. The flow characteristics were studied in a 1.031 cm ID pipe. Salt was added to the solutions in order to change the conformation of the polymers. The

polyelectrolytes were good drag-reducers, and behaved similarly to non-ionic polymers. In the presence of salt the slightly ionic polymer showed values of the onset and extent of drag reduction parameters which would be expected for the molecular weight and conformation. For the highly ionic polymer the extent parameter was slightly less than expected. When dissolved in distilled water both polymers followed the maximum drag reduction asymptote, with no onset point. However, at low concentrations the flow lines for the highly ionic polymer lay between the MDR asymptote and the Prandtl line. (Author)
AD-713 217 HC$3.00 MF$0.65

STEADY TWO-DIMENSIONAL VISCOUS FLOW OF AN INCOMPRESSIBLE FLUID PAST A CIRCULAR CYLINDER,
California Inst of Tech Pasadena
Herbert B. Keller, and Hideo Takami. 1969, 10p
AROD-7625:10-M
Contract DAHC04-68-C-0006
Prepared in cooperation with New York Univ., N. Y. Courant Inst. of Mathematical Sciences, Contracts DA-31-124-ARO-D-360 and AT (30-1)-1480 and Tokyo Univ. (Japan).
Availability: Pub. in High-Speed Computing in Fluid Dynamics. The Physics of Fluids Supplement II, v12 n12 p51-56 Dec 69.

Descriptors: (*Two-dimensional flow, Numerical analysis), (*Cylindrical bodies, Incompressible flow), Navier-Stokes equations, Reynolds number, Drag, Base pressure, Vortices.

Numerical solutions of the steady Navier-Stokes equations are presented for two-dimensional flows past a circular cylinder in an infinite domain. The flow is assumed to be uniform at infinity upstream and the range of Reynolds numbers extends from 1 to 60. The Navier-Stokes equations are replaced by a set of finite difference equations and the numerical solution is obtained by means of an iteration method. Conditions at 'infinity' are applied by matching to Imai's asymptotic solution. The results are compared with those of other analytical and numerical computations as well as with experiments. In particular, the discussion is concerned with the drag, the base pressure, the shape of the standing vortices, and some formulas suggested for large Reynolds numbers. Excellent agreement with recent experiments of Acrivos, Leal, Snowden, and Pan is obtained. (Author)
AD-713 225

MAGNETODYNAMIQUE DES FLUIDES SANS INERTIE (Inertialess Magnetodynamics of Fluids),
Cornell Univ Ithaca N Y
G. S. S. Ludford. 1970, 20p AROD-5329:22-M
Contract DA-31-124-ARO-D-325, Grant NSF-GP-8711
Prepared in cooperation with Paris Univ. (France). Dept. of Mechanics. Text in French.
Availability: Pub. in Colloques Internationaux du Centre National de la Recherche Scientifique, n184 p161-176, 16-20 Jun 69.

Descriptors: (*Three-dimensional flow, *Magnetohydrodynamics), Inertia, Electrical conductance, Partial differential equations, Equations of motion, France.

Recent papers have shown a remarkable difference between plane and three-dimensional flow in a tube, of a liquid having small electrical conductivity and kinematic viscosity, in an intense transverse magnetic field. This difference remains if inertia is neglected, which case leads to the asymptotic behavior of the solutions of a linear partial differential equation of the fourth order, the 'double equation of Oseen.' This is established by giving the general solution of the equations of motion without inertia. From knowledge of certain asymptotic properties an example is constructed, for which the boundary conditions are simpler than those of the physical problem considered, but which exhibits the essential difference between plane and three-dimensional flow. (Author)
AD-713 297

THE PROBLEM OF AN INFINITELY LONG CIRCULAR CYLINDER IN AN OBLIQUE SEA,
Admiralty Experiment Works Haslar (England)
W. E. Bolton. Jul 70, 94p Rept no. AEW-8/70
NSTIC-27519

Descriptors: (*Cylindrical bodies, Hydrodynamics), (*Ocean waves, Cylindrical bodies), Ship hulls, Oscillation, Equations of motion, Great Britain.

A fixed infinitely long circular cylinder half submerged in, and with its axis in the free surface of an ideal fluid is considered. This cylinder is acted upon by a regular wave train whose direction of motion makes an oblique angle with the axis of the cylinder. The object of the paper is to find the vertical force per unit length on the cylinder due to these waves. (Author)
AD-713 302 HC$3.00 MF$0.65

EFFECT OF A ROTATIONAL WAKE ON THE WAVEMAKING RESISTANCE OF AN OGIVE,
Iowa Inst of Hydraulic Research Iowa City
Jean-Claude Tatinclaux. 17 Nov 69, 17p Rept no. IIHR-Reprint-264
Contract Nonr-1611 (05)
Availability: Pub. in Jnl. of Ship Research, p84-99 Jun 70.

Descriptors: (*Drag, Ogives), Wake, Water waves, Rotation, Equations of motion.

The rotational wake of a two-dimensional ogive in an unbounded fluid is simulated by a volume distribution of vertical line vortices. Expressions for the wave elevation and the wave resistance, including wake effect, are derived. It is found that, with the chosen vorticity, the wave resistance is from 10 percent larger to 35 percent smaller, depending upon the Froude number, than in the irrotational case. (Author)
AD-713 338

WAKE CURVATURE AND THE KUTTA CONDITION.
Technical summary rept.,
Wisconsin Univ Madison Mathematics Research Center
D. A. Spence. Dec 69, 26p Rept no. MRC-TSR-1033
Contract DA-31-124-ARO (D)-462

Descriptors: (*Wake, Curved profiles), Potential theory, Navier-Stokes equations, Flat plate models, Vortices.

The outer potential problem for attached flow at incidence past a thin flat plate is set up with a vortex sheet to represent the wake, leading to a singular integro-differential equation for the mean slope of this sheet. Solution yields a correction to the Kutta Joukowski circulation. (Author)
AD-713 436 HC$3.00 MF$0.65

MANNED UNDERWATER STATION RESISTANCE IN STILL WATER AND IN WAVES.
California Univ Berkeley Coll of Engineering
For primary bibliographic entry see Field 13J.
AD-713 458 HC$3.00 MF$0.65

THE ROLE OF RAO'S POSTULATE IN THE OPTIMIZATION OF THRUST NOZZLES OF A GIVEN LENGTH,
Aerospace Research Labs Wright-Patterson AFB Ohio
Karl G. Guderley. 22 Dec 69, 10p Rept no. ARL-70-0215V
Availability: Pub. in Zeitschrift fuer Flugwissenschaften, v18 n2/3 p40-44 1970.

Descriptors: (*Nozzles, Optimization), Thrust, Control surfaces.
Identifiers: Rao postulate.

In a method due to G. V. Rao for the computation of nozzles which have maximum thrust at a given length, the flow differential equations do not appear at all in the formulation of the variational problem. Instead, a postulate is introduced which one would suppose to be automatically satisfied, i. e., that the thrust should be insensitive against a deformation of the control surface. Rao has shown by direct computation that the control surface so obtained satisfies the characteristic conditions. Some of the equations derived from the variational problem imply that the control surface assumes the characteristic direction in any case. The present paper shows that, because of other conditions which arise from Rao's postulate, a flow field with finite first derivatives can be constructed in the vicinity of the control surface. Hence it follows that all characteristic conditions are satisfied along the control surface. (Author)
AD-713 464

QUARTERLY BULLETIN OF THE DIVISION OF MECHANICAL ENGINEERING AND THE NATIONAL AERONAUTICAL ESTABLISHMENT.
Rept. for 1 Apr-30 Jun 70.
National Research Council of Canada Ottawa (Ontario) Div of Mechanical Engineering

30 Jun 70, 62p Rept no. DME/NAE-1970 (2)
See also AD-710 638.

Descriptors: (*Liquid jets, *Water), (*Construction materials, *Clay), Cutting, Wastes (Industrial), Mechanical engineering, Aeronautics, Canada.
Identifiers: *Hydraulic jets.

Contents: Research into the properties and applications of high energy water jets; Utilization of spent sulphate liquor in foamed clay building materials; Current projects of the Division of Mechanical Engineering and the National Aeronautical Establishment.
AD-713 489 HC$3.00 MF$0.65

RESULTS OF TRAILING VORTEX STUDIES IN A TOWING TANK,
Boeing Scientific Research Labs Seattle Wash
John H. Olsen. Sep 70, 25p Rept no. DI-82-1004

Descriptors: (*Vortices, *Wake), Aircraft, Interference, Flow visualization, Stability, Aviation safety, Water tunnels.

Flow visualization studies were performed in a towing tank using an electrochemically activated dye. Although test Reynolds numbers were far below flight Reynolds numbers (10,000 vs 10,000,000), the results were strikingly similar to flight test data. Two types of instability were observed in the tank. An instability associated with the axial flow within the core was observed to destroy the flow in the neighborhood of the core without destroying the motion far from the core. A second instability involving the mutual interaction of the two vortices was observed but somewhat masked by the first instability. (Author)
AD-713 496 HC$3.00 MF$0.65

KINEMATICS OF DIFFUSION, FLUIDS AND PLASMA BY CONTINUOUS MOVEMENT AND FINITE VELOCITIES,
Deseret Test Center Fort Douglas Utah
Ronald E. Meyers. 1970, 15p

Descriptors: (*Kinematics, Equations of motion), N-body problem, Partial differential equations, Stochastic processes, Brownian motion, Probability density functions, Atmospheric motion, Plasma medium, Turbulence, Integration.
Identifiers: Hyperbolic differential equations, Markov processes.

Einstein, Chandrasekhar, and others using Markov processes have derived parabolic differential equations governing physical processes such as Brownian motion, diffusion, and stellar dynamics.

Unfortunately, a mathematically admissable limiting process used in these derivations leads to infinite particle velocities. While Einstein and Chandrasekhar realized the drastic nature of the approximations employed in the parabolic formulation, there has been widespread indiscriminate use and generalization of their equations without regard to the fundamental limitations imposed by those approximations. It is believed that the following is the framework of a general theory which provides a systematic, comprehensive, and useful approach to studying phenomena based on particulate motion. The present 'hyperbolic' theory is a modification and generalization of a hyperbolic diffusion model and attempts to represent more accurately the physical process of diffusion. (Author)
AD-713 588 HC$3.00 MF$0.65

AN INVESTIGATION OF A SUPERSONIC SURFACE JET-HYPERSONIC FLOW INTERACTION WITH AXIAL SYMMETRY.
Doctoral thesis,
Boeing Scientific Research Labs Seattle Wash
Raymond P. Shreeve. Sep 70, 150p Rept no. D1-82-0999

Descriptors: (*Jets, *Two-dimensional flow), (*Jet mixing flow, Interactions), Supersonic flow, Hypersonic flow, Axially symmetric flow, Surfaces, Aerodynamic slots, Theses.

The complex interaction between a supersonic air jet from a slot with a hypersonic flow of air over a surface was investigated experimentally. The conditions were such that the boundary layer was fully turbulent and both injectant and free stream, at different temperatures, could be considered to be perfect gases. The design of the experiment followed a consideration of the governing non-dimensional groups. From physical arguments, the parameters considered to control major changes in the interaction structure, the angle of the jet to the surface, and the jet to free stream pressure ratio, were selected for study. The experiment was carried out at M = 6 using a 5 deg cone with a circumferential slot. Optical observations were made and surface pressures were measured. Impact pressure and stagnation temperature surveys were recorded and reduced to obtain mass flux and other flow profiles using digital computer techniques. (Author)
AD-713 603 HC$3.00 MF$0.65

ON THE TURBULENT FLOW OVER A WAVY BOUNDARY,
Scripps Institution of Oceanography La Jolla Calif
Russ E. Davis. 18 Feb 70, 12p
Contracts N00014-69-A-0200-6006, Nonr-2216 (23)
Revision of report dated 11 Aug 69.
Availability: Pub. in Jnl. of Fluid Mechanics, v42 Pt-4 p721-731 1970.

Descriptors: (*Turbulence, *Water waves), Stresses, Numerical analysis.

Two hypotheses concerning the turbulent flow over an infinitesimal-amplitude travelling wave are investigated. One hypothesis, originally made by Miles, is that the wave does not affect the turbulence and therefore the turbulent Reynolds stresses are dependent only on height above the mean wave surface. Alternatively, the proposal that turbulent stresses are primarily dependent on height above the instantaneous wave surface is examined. Numerical solutions of the appropriate equations are compared with Stewart's recent experimental results and with the approximate solutions employed by Miles and others. No definite conclusion can be reached from comparison with experimental results since the predicted flows are quite sensitive to details of the mean velocity profile near the wave surface where no data was taken. It is found that the asymptotic results do not apply for the conditions investigated. (Author)
AD-713 627

A COMPACT THRUST AUGMENTING EJECTOR EXPERIMENT.
Final rept.,
Aerospace Research Labs Wright-Patterson AFB Ohio
Richard B. Fancher. Aug 70, 53p Rept no. ARL-70-0137

Descriptors: (*Thrust augmentation, Ejection), (*Jets, Thrust augmentation), Nozzle gas flow, Momentum, Performance (Engineering), Diffusers.
Identifiers: *Ejectors.

The report briefly reviews the potential momentum thrust performance of ejectors. In addition to thrust performance, an ejector's utility to a V/STOL propulsion system is determined by several other factors including ejector size and ducting requirements. A survey of previous ejector experimental results are presented for ejectors with inlet area ratios in the neighborhood of 15 to 20. A compact two-dimensional ejector experiment with an inlet area ratio of 19 is described. This ejector with a 1.9 area ratio exit diffuser achieved a thrust augmentation ratio of 1.71 and 1.78 for an ejector length to minimum channel width ratio of 3.5 and 5.1 respectively. It is believed that improvements in primary injection techniques were responsible for this favorable thrust performance. (Author)
AD-713 634 HC$3.00 MF$0.65

OPTIMALE AUSRICHTUNG VON ROTATIONSSYMMETRISCHEN DRALLSTABILISIERTEN KOERPERN IN ABHAENGIGKEIT VOM TRAEGHEITSMOMENTENVERHAELTNIS (Optimal Alignment of Rotational-Symmetrical, Spin-Stabilized Bodies, Considering the Characteristics of the Moment of Inertia),
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Oberpfaffenhofen (West Germany)
Lothar Schmieder. 1970, 6p Rept no. DFVLR-Sonderdruck-50
Text in German; attached summary in English.
Availability: Pub. in Raumfahrtforschung, n3 p103-107 May/Jun 70. No copies furnished.

Descriptors: (*Aerodynamic configurations, Guidance), Jets, Spin stabilization, West Germany.

On condition that the angular velocity of a spin stabilized rigid body - the moment of inertia of which has rotational (not spherical) symmetry - is constant, then this body may be aligned by means of one single jet. The pulses of this jet may be approximated by a delta function. The trajectories which are traced by the spin axis and the vector of the angular momentum are projected on a cylinder. This cylinder is unrolled on to the plane of the complex numbers, and the paths are then described by complex functions. Solutions, which are meaningful in a technical sense, consist of cycles of N pulses in equidistant intervals, which are compared with the fuel optimal and time optimal solution. (Author)
AD-713 647

RESEARCHES ON THE PROPAGATION AND DECAY OF VORTEX RINGS.
Final rept.,
Aerospace Research Labs Wright-Patterson AFB Ohio
Gary M. Johnson. Jun 70, 51p Rept no. ARL-70-0093

Descriptors: (*Vortices, Propagation), Rings, Jets, Smokes, Flow visualization.
Identifiers: Unsteady flow.

The propagation of vortex rings in air was studied via stroboscopic photography and hot-wire anemometry. Measurements of vortex time of flight, axial velocity distribution, and geometry were made. Empirical formulas are developed and compared with the existing theories. It is found that the linear momentum of vortex rings is conserved and that the ratio of vortex ring radius to core radius is approximately constant. (Author)
AD-713 705 HC$3.00 MF$0.65

DYNAMIC VISCOUS PRESSURE INTERACTION IN HYPERSONIC FLOW,
National Aeronautical Establishment Ottawa (Ontario)
Kazimierz J. Orlik-Ruckemann. Jul 70, 86p Rept no. NAE-LR-535 NRC-11598

Descriptors: (*Boundary layer, Pressure), (*Hypersonic flow, Pressure), Distribution, Oscillation, Interactions, Low frequency, Canada.
Identifiers: Pressure distribution.

A method is presented for the determination of the effect of boundary layer on the unsteady pressure distributions on an oscillating body in continuum hypersonic flow. The method is based on the concept of dynamic viscous pressure interactions, which takes into account the relative motion between the body surface and the boundary-layer displacement surface. The method can be applied to arbitrary bodies and flow conditions, provided the relevant inviscid unsteady pressure distributions and the dependence of the boundary-layer displacement on the steady flow variables are known. In its present version the method is limited to low-frequency and small-amplitude oscillations. (Author)
AD-713 717 HC$3.00 MF$0.65

SLOSHING FREQUENCIES FOR A HALF-SPACE WITH CIRCULAR OR STRIP-LIKE APERTURE,
California Univ Los Angeles Numerical Analysis Research
Peter Henrici, B. Andrew Troesch, and Luc Wuytack. 16 Dec 69, 36p
Contracts N00014-69-A-0200-4022, Nonr-233 (76)
Sponsored in part by Grant NSF-GP-7522.
Availability: Pub in Jnl. of Applied Mathematics and Physics (Zamp), v21 n3 p285-318 1970.

Descriptors: (*Sloshing, Frequency), Approximation (Mathematics), Mathematical models.

The paper contains approximations (with rigorous error bounds) for the sloshing frequencies of an ideal fluid contained in a half-space with circular or striplike aperture. The mathematical model is a limiting case of the classical model for finite containers. In view of the well known domain monotonicity of the eigenvalues, the values for the half-space are universal upper bounds for the corresponding eigenvalues of arbitrary finite or infinite containers with such apertures. (Author)
AD-713 743

THE CALCULATION OF ADIABATIC LAMINAR BOUNDARY LAYER SHOCK WAVE INTERACTIONS IN AXI-SYMMETRIC FLOW. PART I. HOLLOW CYLINDER-FLARE BODIES WITH ZERO SPIN.
von Karman Inst. for Fluid Dynamics, Rhode-Saint-Genese (Belgium).
For primary bibliographic entry see Field 1A.
AD-873 051 HC$3.00 MF$0.65

MAMMAL REACTION TO HYDRODYNAMIC FORCES STUDIED,
Joint Publications Research Service, Washington, D.C.
For primary bibliographic entry see Field 6C.
JPRS-51614 HC$3.00 MF$0.65

METHODS OF COMPUTING FLUID MOTION IN TWO-DIMENSIONAL CARTESIAN OR CYLINDRICAL COORDINATES BY FOLLOWING LAGRANGIAN ENERGY CELLS,
Los Alamos Scientific Lab., N. Mex.
Patrick J. Blewett. Jul 70, 17p
Contract W-7405-eng-36

Descriptors: (*Fluid flow, Equations of motion), Two dimensional flow, Computation, Lagrange equations of motion.

For abstract, see NSA 24 20.
LA-4464 HC$3.00 MF$0.65

ON THE MOTION OF LIQUIDS ENCLOSED IN AEROSPACE VEHICLE TANKS UNDER WEAK GRAVITATIONAL FIELDS. VOLUME 1 - THEORETICAL CONSIDERATIONS.
Unidev, Inc., Huntsville, Ala.
L. L. Fontenot. Mar 70, 110p NASA-CR-113117, UR-00010-VOL-1
Contract NAS8-21272

Descriptors: *Cylindrical tanks, *Liquid sloshing, *Mathematical models, *Propellant tanks, *Reduced gravity, Equations of motion, Launch vehicles, Liquid rocket propellants, Perturbation theory.

For abstract, see STAR 08 21.
N70-37812 HC$3.00 MF$0.65

ANALYSIS OF FLUID SLOSHING IN ARBITRARY TANKS HAVING ROTATIONAL SYMMETRY - A CORRECTION FOR LOW GRAVITY CONDITIONS. VOLUME 2 - COMPUTATIONAL APPLICATION.
Unidev, Inc., Huntsville, Ala.
T. S. Chandler, and D. O. Lomen. Mar 70, 114p NASA-CR-102732, UR-00011-VOL-2
Contract NAS8-21272

Descriptors: *Computer programs, *Cylindrical tanks, *Liquid sloshing, *Propellant tanks, *Reduced gravity, Equations of motion, Liquid rocket propellants.

For abstract, see STAR 08 21.
N70-37813 HC$3.00 MF$0.65

SMALL OSCILLATIONS OF A VISCOUS ISOTHERMAL ATMOSPHERE.
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
For primary bibliographic entry see Field 1A.
For abstract, see STAR 08 21.
N70-38131 HC$3.00 MF$0.65

QUASI-ONE-DIMENSIONAL NOZZLE FLOWS WITH VIBRATIONAL AND DISSOCIATIONAL NON-EQUILIBRIUM.
Quasi-eindimensionale Duesenstroenungen Mit Schwingungsnichtgleichgewicht Und Relaxierender Dissoziation
Techtran Corp., Glen Burnie, Md.
K. Robert. Aug 70, 46p NASA-TT-F-12947, DLR-FB-70-01
Contract NASW-2037
Coll- 46 P Refs Tran- Transl. Into English of West German Report Dlr-fb-70-01, Jan. 1970 P 1-55

Descriptors: *Gas dynamics, *Nonequilibrium flow, *Nozzle flow, Continuity equation, Molecular relaxation, Nitrogen, Nozzle geometry, Numerical integration, Thermodynamics.

For abstract, see STAR 08 21.
N70-38315 HC$3.00 MF$0.65

NONLINEAR ACTUATOR DISK THEORY AND FLOW FIELD CALCULATIONS, INCLUDING NONUNIFORM LOADING.
M. D. Greenberg, and S. R. Powers. Sep 70, 83p NASA-CR-1672
Contract NAS1-8173
Coll- 83 P Refs

Descriptors: *Actuator disks, *Flow distribution, *Nonuniform flow, *Propeller efficiency, Axisymmetric flow, Integral equations, Lifting rotors, Newton-raphson method, Static thrust.

For abstract, see STAR 08 21.
N70-38435 HC$3.00 MF$0.65

THE EFFECT OF A SPIKE ON THE DRAG AND STABILITY OF BLUNT BODIES IN SUPERSONIC FLOW.
National Aeronautics and Space Administration, Washington, D. C.
C. Zorea /zaritzky/. Sep 70, 73p NASA-TT-F-13078
Tran- Transl. Into English of An Israel Inst. of Tech. Thesis

Descriptors: *Blunt bodies, *Drag reduction, *Spikes (aerodynamic configurations), Aerodynamic drag, Nose cones, Supersonic drag.

For abstract, see STAR 08 21.
N70-38450 HC$3.00 MF$0.65

THE IMPACT OF A SUPERSONIC FLOW OF GAS ON A FLAT OBSTACLE.
Udar Neravnomernogo Sverkhzvukovogo Potoka Gaza V Ploskuyu Pregradu
Techtran Corp., Glen Burnie, Md.
M. G. Lebedev. Aug 70, 14p NASA-TT-F-13028
Contract NASW-2037
Rom Izv. Akad. Nauk Sssr, Mekh. Zhidk. Gaza Coll- 14 P Refs Tran- Transl. Into English From Izv. Akad. Nauk Sssr, Mekh. Zhidk. Gaza (Moscow), No. 3, 1969 P 164-171

Descriptors: *Flat surfaces, *Flow equations, *Supersonic flow, *Turbulent flow, *Two dimensional flow, Flow distribution, Impact loads, Mathematical models, Shock waves, Unsteady flow.

For abstract, see STAR 08 21.
N70-38476 HC$3.00 MF$0.65

ENGINEERING ANALYSIS OF NON- NEWTONIAN FLUIDS.
Advisory Group for Aerospace Research and Development, Paris (France).
D. C. Bogue, and J. L. White. Jul 70, 106p
AGARDOGRAPH-144-70

Descriptors: *Fluid flow, *Nonnewtonian fluids, *Production engineering, *Rheology, Bibliographies, Hydrodynamics, Industrial plants, Polymer physics, Viscometry.

For abstract, see STAR 08 21.
N70-38492 HC$3.00 MF$0.65

SOLUTION OF THE THREE-DIMENSIONAL TIME-DEPENDENT NAVIER- STOKES EQUATIONS BY THE DIFFERENCE METHOD.
Die Loesung Der Dreidimensionalen Instationaeren Navier-stokes-gleichungen Mit Dem Differenzenverfahren
Deutsche Forschungs- Und Versuchsanstalt Fuer Luft- Und Raumfahrt, Karlsruhe (West Germany).
W. Schoenauer. Apr 70, 135p DLR-FB-70-15
Lang- in German, English Summary

Descriptors: *Difference equations, *Navier-stokes equation, *Reynolds number, *Three dimensional flow, *Time dependence, *Turbulent flow, Computer programs, Iterative solution, Matrices (mathematics).

For abstract, see STAR 08 21.
N70-38683 HC$3.00 MF$0.65

MICROSCOPIC OPEN CHANNEL BOUNDARY LAYER VELOCITY MEASUREMENT USING A VIRTUAL IMAGE METHOD.
Research rept.,
Illinois Univ., Urbana. Water Resources Center.
Harry G. Wenzel, and Kuo C. Chang. Apr 70, 39p WRC-RR-31 W71-00470, OWRR-A026-Ill (1)
Contract DI-14-01-0001-1632

Descriptors: (*Velocity measurement, *Flow visualization), (*Open channel flow, *Boundary layer flow), Microscopy, High speed cameras, Motion picture cameras, Photographic images.

A method for velocity measurement is described which employs a microscope and high speed motion picture camera to record the motion of small tracer particles suspended in the flow. The procedure, termed the image method, involves particle illumination such that the particle itself and its virtual image created by reflection from a boundary both appear on the film. The boundary is then located equidistant from the two images. The plane of focus is oriented normal to the boundary giving a picture of the entire velocity profile normal to the boundary within the limits of the field of view. A frame by frame analysis of the particle motion can yield velocity profile and turbulence information. The image method was adapted to a small open channel. Considerable difficulty was encountered in illuminating the particles with sufficient intensity to impress their image on the film. Thus, quantitative data were not obtained. It was concluded that the lens system used to focus the light source was inadequate. However, the method has potential applications in velocity measurement near a boundary and flow visualization studies. (Author)
PB-195 163 HC$3.00 MF$0.65

GRADIENT SHOCK TUBES WITH STRONG INCIDENT SHOCK WAVES IN HYDROGEN,
Sandia Labs., Albuquerque, N. Mex.
For primary bibliographic entry see Field 1A.
For abstract, see NSA 24 20.
SC-RR-70-537 HC$3.00 MF$0.65

PHASE TRANSFORMATIONS IN THE ACTINIDES,
California Univ., Livermore. Lawrence Radiation Lab.
Alfred Goldberg, and Tadeusz B. Massalski. 29 Jun 70, 122p* CONF-701001-5
Presented at the International Conference on Plutonium and other Actinides (4th), Santa Fe, N. Mex. 5-9 Oct 70.

Descriptors: (*Actinide series, *Allotropy), Phase transformations, Plutonium, Uranium.

For abstract, see NSA 24 20.
UCRL-72557 HC$3.00 MF$0.65

20E. Masers and Lasers

CONSOLIDATED QUARTERLY REPORT FOR THE PERIOD OCTOBER 1, 1969 TO DECEMBER 31, 1969.
Technical rept.,
Utah Univ Salt Lake City Microwave Device and Physical Electronics Lab
R. L. Arnold, J. M. Baird, N. E. Buholz, L. Campbell, and P. W. Chen. 31 Dec 69, 73p Rept nos. MDL-Q31, UTEC-MD-70-158
Contracts F44620-68-C-0022, N00014-69-C-0345
See also report dated 30 Jun 69, AD-873 247.

Descriptors: (*Electronics, *Air force research), Lasers, Oscillators, Piezoelectric crystals, Semiconductors, Interactions, Plasma physics, Non-destructive testing, Microwaves, Propellants, Rings.
Identifiers: Quantum electronics, Raman spectra.

Contents: Optical frequency tuning by parametric operation; Carbon dioxide laser; Tunable raman effect in crystals; ring laser studies; An impedance analysis of double-stream interaction in semiconductors; Double-stream interaction under crossed electric and magnetic fields in semiconductors; Investigation of techniques for using microwaves to measure cracks or voids in solid propellants.
AD-713 157 HC$3.00 MF$0.65

CONSOLIDATED QUARTERLY REPORT FOR THE PERIOD JULY 1, 1969 TO SEPTEMBER 30, 1969.
Technical rept.,
Utah Univ Salt Lake City Microwave Device and Physical Electronics Lab
R. L. Arnold, J. M. Baird, N. E. Buholz, L. Campbell, and P. W. Chen. 30 Sep 69, 138p Rept nos. MDL-Q30, UTEC-MD-70-146
Contracts F44620-68-C-0022, N00014-69-C-0345
See also report dated 31 Dec 69, AD-713 157.

Descriptors: (*Electronics, Air force research), Lasers, Oscillators, Piezoelectric crystals, Rings, Carbon dioxide, Semiconductors, Interactions, Solid state physics, Microwaves, Plasma physics.
Identifiers: Quantum electronics, Raman spectra.

Contents: Optical frequency tuning by parametric operation; Carbon dioxide laser; Tunable raman effect in crystals; Ring laser studies; Double-stream interaction in solid-state materials; An impedance analysis of double-stream interaction in semiconductors; Double-stream interaction under crossed electric and magnetic fields in semiconductors; Measurement of chamber temperature by microwave techniques.
AD-713 158 HC$3.00 MF$0.65

SEARCH FOR A FOUR-MICRON MOLECULAR LASER.
Final rept. 15 Apr 68-31 Jul 70,
Tetra Tech Inc Pasadena Calif
John M. Flournoy. Sep 70, 28p* Rept no. TT-TC-138-1
Contract N00014-68-C-0423
Report on Project DEFENDER.

Descriptors: (*Gas lasers, *Cyanides), Excitation, Molecular energy levels, Vibration, Infrared radiation, Electron transitions.
Identifiers: *Hydrogen cyanide lasers, Defender project, Collisional energy transfer, *Infrared lasers, Emission spectra.

Experiments have been conducted in an effort to achieve continuous laser action in HCN, which has a vibrational transition at 3.86 microns, a wavelength which falls well within the atmospheric window just below 4 microns. Indirect excitation of the upper level (the C-H stretching fundamental) was accomplished by collisions with vibrationally excited hydrogen, deuterium, and nitrogen, without apparent decomposition of the HCN, which is known to suffer extensive decomposition when exposed to an electric discharge. The upper level (001) was identified by infrared emission spectroscopy, and its concentration was estimated to be several per cent at a pressure of 0.05 torr of HCN and 1 torr of discharge-excited H2. No oscillations were observed with HCN excited by H2 or N2 in a 1-meter flowing laser system even when dry-ice cooling was used to reduce the population of the lower (010) level, which is the bending fundamental. (Author)
AD-713 193 HC$3.00 MF$0.65

INFRARED DETECTORS, LASER TECHNOLOGY AND SIGNAL PROCESSING.
Annual rept. no. 3, 1 Sep 69-30 Aug 70,
Minnesota Univ Minneapolis Dept of Electrical Engineering
R. J. Collins. Sep 70, 107p
Contract N00014-68-A-0141-0002
See also Annual rept. no. 2, AD-698 153.

Descriptors: (*Gas lasers, Performance (Engineering)), (*Infrared detectors, *Photocathodes), Gain, Noise (Radio), Raman spectroscopy, Cadmium, Light pulses, Vacuum apparatus, Irasers, Formic acids.
Identifiers: Carbon dioxide lasers, Helium cadmium lasers, Laser produced plasmas.

During the third year of the grant research was carried out in the areas of CO2 laser technology, photoelectric detection in the near infrared, the helium-neon-cadmium laser system, mass spectroscopy of CO2:N:He discharges, optical heterodyning, optically induced scattering in solids, and studies on mixtures of formic acid and nitrogen forming a CO2 laser by dissociation. In the sections of the report summaries of each phase is given. The measurement of gain profiles in CO2 lasers has lead to the construction of a high gain CO2 amplifier, and detailed knowledge of the generation of multiple beams in solids through optically induced phase gratings. (Author)
AD-713 223 HC$3.00 MF$0.65

FINAL REVIEW REPORT.
California Inst of Tech Pasadena
For primary bibliographic entry see Field 20I.
AD-713 228 HC$3.00 MF$0.65

OPTICALLY PUMPED GASDYNAMIC MOLECULAR LASER (Gazodinamicheskii Molekulyarnii Lazer s Opticheskoi Nakachkoi),
Naval Intelligence Command Alexandria Va Translation Div
V. A. Batanov, F. V. Bunkin, A. M. Prokhorov, and V. B. Fedorov. 21 Oct 70, 5p Rept no. NIC-Trans-3127
Trans. of Akademiya Nauk SSSR. Doklady, v191 n6 p1267-1269 1970.

Descriptors: (*Gas lasers, Pumping (Optical)), Performance (Engineering), Irasers, USSR.
Identifiers: *Carbon dioxide lasers, Translations.

The advantages of molecular gases in lasers with noncoherent optical pumping are well known and conditioned on the one hand by a relatively broad spectral pumping-light absorption band, and on the other by a relatively narrow working-transition line width. One such laser - the photodissociation laser - has been in existence for a long time already. The present paper proposes an infrared molecular laser with optical pumping to the vibrational-rotational band of the molecule in the electron ground state, and noncoherent emission from an 'immovable' shock wave arising during steady escape of the working mixture from the nozzle under conditions of incomplete expansion of the gas into the atmosphere. The composition of this gas can either correspond or not with that of the working mixture. Everywhere below, for simplicity, by working mixture the authors mean the mixture CO2 + N2 + He. In this, helium plays the same role as in CO2 lasers with electrical discharge. The nitrogen mixture is not necessary to achieve inversion, but it proves favorable, laser level and, secondly, to expansion of the vibrational-rotational pumping absorption band.
AD-713 275 HC$3.00 MF$0.65

THE HISTORICAL DEVELOPMENT OF A SOLID STATE MASER AMPLIFIER.
Group rept.,
Massachusetts Inst of Tech Lexington Lincoln Lab
James W. Meyer. 19 Jul 57, 23p Rept no. Group M37-17 ESD-TR-70-313
Contract AF 19 (122)-458

Descriptors: (*Masers, History), Molecular energy levels, Performance (Engineering), Microwave amplifiers, Experimental design.
Identifiers: *Solid state masers.

The report contains an historical sketch of events leading to the development of a solid state amplifier which operates on the principle of stimulated emission of radiation. The mode of operation of the device developed at Lincoln Laboratory is described and its characteristics both as an amplifier and as an oscillator are presented. (Author)
AD-713 398 HC$3.00 MF$0.65

GAIN MEASUREMENTS IN A RAPID GAS DYNAMIC EXPANSION,
Boeing Scientific Research Labs Seattle Wash
A. L. Hoffman, G. J. Mullaney, M. T. Holden, and A. L. Pindroh. Oct 70, 22p Rept no. D1-82-1006

Descriptors: (*Nozzle gas flow, *Gas lasers), (*Carbon dioxide, *Excitation), Relaxation time, Amplifiers, Molecular energy levels.
Identifiers: *Carbon dioxide lasers, Gas expanders.

A double expansion nozzle was used in a shock tube facility to study the population inversions achieved in a CO2 lasing gas mixture. For these experiments the double expansion nozzle, a form of gas-dynamic throttle, was a means for increasing the gain path length in the shock tube apparatus by a factor of five. Gain measurements were made for various reservoir conditions of temperature (1000 < or = T (0) < or = 2600K) and pressures after final expansion through a Mach = 4, twenty-nine element, multiple nozzle to (5 < or = p < or = 100 torr). The small signal gain is a function of the population inversion in the non-equilibrium flow and the line broadening. Measurements were made in both the collision and Doppler broadened regions. Numerical computations were made based on available relaxation rates and compared with experiment. Evaluations of the accuracy of these rates were made, and in the case of the depopulation of the lower laser state due to helium it was found that the V-T rate is faster than previously thought. Thus, gain measureements in a gas dynamic expansion can actually be used to measure relaxation rates. (Author)
AD-713 497 HC$3.00 MF$0.65

OPTIMIZATION ANALYSIS OF A COMPACT LIGHTWEIGHT LASER RANGEFINDER,
Frankford Arsenal Philadelphia Pa
Joseph Costantino, Carmen Pontelandolfo, and Donald Reago. 1970, 10p

Descriptors: (*Lasers, *Range finding), (*Fire control systems, Design), Optimization, Dc to dc converters, Power supplies, Avalanche diodes, Photodiodes, Signal-to-noise ratio, Optical equipment components, Time-interval counters.
Identifiers: Q switched lasers, Laser range finders.

The purpose of the paper is to describe the optimization methods used to achieve a laser rangefinder design that would be suited for use in mortar fire control. (Author)
AD-713 517 HC$3.00 MF$0.65

THE APPLICATION OF A SOLID STATE HELIUM-NEON GAS LASER TO MISSILE GUIDANCE,
Army Advanced Ballistic Missile Defense Agency Huntsville Ala
For primary bibliographic entry see Field 17G.
AD-713 527 HC$3.00 MF$0.65

THRESHOLD EFFECTS OF CHEMICAL MIXTURES IN THE HCN LASER,
Army Electronics Command Fort Monmouth N J Electronic Components Lab
George E. Morris, Harold Jacobs, Charles S. Brand, and Thomas R. Mooney. 1970, 14p*

Descriptors: (*Gas lasers, Additives), Carbon dioxide, Oxygen, Gas discharges, Gas flow, Acetonitriles, Pumping (Optical), Molecular energy levels, Decomposition.
Identifiers: *Hydrogen cyanide lasers, *Infrared lasers, Output, Chemical reaction mechanisms.

The discovery of the HCN laser has given scientists, for the first time, an inexpensive coherent source in the submillimeter region of the spectrum. Experiments are described there various chemicals were added to the basic laser fuel, CH3CN (acetonitrile), in the HCN laser. Laser output power at 337 milimiters wavelength and current threshold, (minimum current necessary for oscillation) were monitored. Results include in-

creased power and efficiency with the addition of CO2 or O2 to the discharge. Experiments also include the characterization of the HCN laser output over a wide range of pumping speeds. Increased pump speed resulted in increased power; however, power saturation occurred at higher pumping speeds. From these results one can obtain insight into the basic mechanism of the HCN laser and develop possible means for improvement. (Author)
AD-713 562 HC$3.00 MF$0.65

CO2 LASER PULSING PRODUCED BY CAVITY-LENGTH MODULATION,
Army Missile Command Redstone Arsenal Ala
Albert L. Pardue, Jr. 1970, 15p

Descriptors: (*Gas lasers, Pulse systems), Light pulses, Oscillators, Experimental design, Test methods.
Identifiers: *Carbon dioxide lasers, Q switched lasers.

It is apparent that the reactive Q-switching pulsing in the CO2 laser is not restricted to the conventional straight laser where only one mode oscillates at a given instant. In the conventional laser the restriction to one such mode appeared to be the major factor. However, the lengthening of the laser cavity in the multipass CO2 laser provided similar pulse widths and repetition rates. Even at low mirror velocities (about 0.5 cm/sec), pulsing was found to be repetitive in waveform shape and amplitude, whereas under similar conditions in the conventional straight laser, irregular pulsing was observed. (Author)
AD-713 570 HC$3.00 MF$0.65

NEODYMIUM YAG LASER FOR OPTICAL RADAR APPLICATIONS,
Army Electronics Command Fort Monmouth N J Electronic Components Lab
For primary bibliographic entry see Field 17E.
AD-713 582 HC$3.00 MF$0.65

OBSERVATION OF CO2 LASER INDUCED ACOUSTICAL WAVES IN CO2,
Army Electronics Command Fort Monmouth N J Inst for Exploratory Research
For primary bibliographic entry see Field 20A.
AD-713 746

LASER COMMUNICATIONS TODAY AND TOMORROW,
Joint Publications Research Service, Washington, D.C.
For primary bibliographic entry see Field 17B.
JPRS-51546 HC$3.00 MF$0.65

SODIUM LINE LASER WITH Na (+) AND H (-) RECOMBINATION,
Joint Publications Research Service, Washington, D.C.
A. M. Shukhtin, and A. S. Tibilov. 15 Oct 70, 26p
Trans. of mono. Fizika Gazovykh Lazerov, Leningrad, 1969 p122-144.

Descriptors: (*Gas lasers, *Sodium), Recombination reactions, Gas discharges, Plasmas (Physics), Atomic orbitals, Applications of mathematics, USSR, Translations.
Identifiers: *Hydrogen sodium lasers, Atom ion interactions, *Collisional energy transfer.

A report is given of an investigation of the generation of sodium-line laser activity by pulse discharges in Na-H2 mixtures.
JPRS-51577 HC$3.00 MF$0.65

DEFECTS AND COLOR CENTERS IN VERNEUIL RUBY LASERS.
Defekte Und Farbzentren in Verneuil-Laserrubinen
Eidgenossische Technische Hochschule, Zurich (Switzerland).
W. J. Borer. 1969, 97p DISS-4301
Lang- in German

Descriptors: *Color centers, *Crystal defects, *Heat treatment, *Ruby lasers, Chromium, Interstitials, Single crystals, Verneuil process.

For abstract, see STAR 08 21.
N70-38312 HC$3.00 MF$0.65

CHEMICAL AND VIBRATIONAL RELAXATION IN SUPERSONIC CARBON DIOXIDE FLOWS.
Techtran Corp., Glen Burnie, Md.
For primary bibliographic entry see Field 7D.
For abstract, see STAR 08 21.
N70-38468 HC$3.00 MF$0.65

BATTELLE INFORMATION NUMBER 1.
Battelle Inst., Frankfurt Am Main (West Germany).
Mar 68, 49p

Descriptors: *Electric power plants, *Energy conversion, *Holography, *Lasers, *Light amplifiers, *Plasma diagnostics, Gas lasers, Raman spectroscopy, Ruby lasers, Solar generators, Wind (meteorology).

For abstract, see STAR 08 21.
N70-38876 HC$3.00 MF$0.65

FRACTIONAL FRINGE HCN LASER-INTERFEROMETER,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 20F.
For abstract, see NSA 24 20.
ORNL-TM-3092 HC$3.00 MF$0.65

RADIATION GENERATED WAVE PROPAGATION IN ELASTIC NONCONDUCTORS,
Sandia Labs., Albuquerque, N.Mex.
For primary bibliographic entry see Field 20L.
For abstract, see NSA 24 20.
SC-RR-70-428 HC$3.00 MF$0.65

20F. Optics

LUMINESCENCE STUDY OF EXCITON-EXCITON INTERACTION IN CADMIUM SULFIDE, CADMIUM SELENIDE, AND ZINC OXIDE.
Cornell Univ Ithaca N Y Materials Science Center
For primary bibliographic entry see Field 20L.
AD-713 181 HC$3.00 MF$0.65

SCATTERING BY A PERIODIC SURFACE,
Michigan Univ Ann Arbor Radiation Lab
For primary bibliographic entry see Field 20N.
AD-713 183 HC$3.00 MF$0.65

INFRARED DETECTORS, LASER TECHNOLOGY AND SIGNAL PROCESSING.
Minnesota Univ Minneapolis Dept of Electrical Engineering
For primary bibliographic entry see Field 20E.
AD-713 223 HC$3.00 MF$0.65

FAR INFRARED SEALED LIQUID CELL WITH POLYETHYLENE WINDOWS,
Brown Univ Providence R I Dept of Chemistry
Andreas T. Tsatsas, and William M. Risen, Jr. 26 Jan 70, 6p AROD-7895:2-C
Grant DA-ARO (D)-31-124-G1068
Revision of report dated 15 Dec 69.
Availability: Pub. in Applied Spectroscopy, v24 n3 p383-384 May/Jun 70.

Descriptors: (*Polyethylene plastics, *Infrared windows), (*Infrared spectroscopy, Infrared windows), Design, Optical equipment.

A simple and very inexpensive method is presented for making ir cells with polyethylene windows which have been successfully used for spectral measurements in the 500-33/cm region.
AD-713 240

ON THE THEORY OF SECOND HARMONIC GENERATION,
Rochester Univ N Y Dept of Physics and Astronomy
R. Asby. 14 Nov 69, 11p AROD-4965:48-P
Grant DA-ARO (D)-31-124-G918
Availability: Pub. in Jnl. of Opto-Electronics, v1 p165-171 1969.

Descriptors: (*Optical phenomena, Harmonic generators), (*Harmonic generators, Theory), Piezoelectric crystals, Electrooptics, Resonators, Mathematical analysis.
Identifiers: *Second harmonic generation.

It is shown how the theory of non-linear interaction between the modes of the open resonator can be applied to second harmonic generation in the absence of a resonator. The conditions under which the second harmonic output, in the small conversion approximation, can be approximated by a Gaussian beam are derived. The optimum value of the focusing parameter l/z sub 0 (here l is the length of the crystal, and z sub 0 is one-half the confocal parameter of the fundamental beam) for the total output is shown to be 5.68 agreeing precisely with the value given by Boyd and Kleinman. (Author)
AD-713 243

DETERMINATION OF THE ATTENUATION OF OPTICAL GLASS FIBRES,
Signals Research and Development Establishment Christchurch (England)
Margaret A. Orsborne. Mar 70, 13p Rept no. SRDE-70024 TRC-BR-20711

Descriptors: (*Fiber optics, Light transmission), (*Optical glass, Attenuation), (*Light communication systems, Performance (Engineering)), Gas lasers, Glass textiles, Scattering, Test methods, Curve fitting, Great Britain.
Identifiers: Helium neon lasers.

The paper describes the equipment and method used to determine the attenuation of multimode optical glass fibres used for optical communications. (Author)
AD-713 262 HC$3.00 MF$0.65

OPTICAL PROPERTIES AND ELECTRONIC DENSITY OF STATES,
Brown Univ Providence R I
For primary bibliographic entry see Field 20L.
AD-713 264

CURRENT-INDUCED REFLECTIVITY EFFECTS IN A SEMICONDUCTOR,
Idaho Univ Moscow Dept of Physics
For primary bibliographic entry see Field 20L.
AD-713 268

A NOTE ON THE GENERALIZED LUNEBURG LENSES,
Michigan Univ Ann Arbor Radiation Lab
For primary bibliographic entry see Field 9E.
AD-713 309

SELF-INDUCED TRANSPARENCY IN TWO-PASS ATTENUATORS AND RELATED PHENOMENA,
Air Force Cambridge Research Labs L G Hanscom Field Mass

Frederic A. Hopf. 23 Oct 69, 13p Rept no. AFCRL-70.0521
Availability: Pub. in Physical Review A, v2 n1 p195-206 Jul 70.

Descriptors: (*Optical phenomena, Attenuators), (*Light pulses, Interactions), Ultrasonic radiation, Coherent radiation, Logic circuits, Light transmission.
Identifiers: *Self induced transparency.

A theory describing two sequential electromagnetic pulses interacting with a resonant, inhomogeneously broadened attenuator is presented. The resulting equations are solved on a computer. Limiting cases are considered which indicate the conditions under which the second pulse is expected to increase in energy. The self-induced transparency effect in a two-pass attenuator is treated using this theory. It is shown that there are qualitative as well as quantitative differences between the single-pass and double-pass cases. For example, curves of output versus input energy in the two-pass case may have observable structure that is sensitive to the presence or absence of atomic coherence. It is found that under a wide range of circumstances, the output for the second pulse is independent of whether the pulse is going in the same or in the opposite direction from the first. This result is seen to be related to more general considerations involving the interaction of a pulse with spatially inhomogeneous systems such as a chain of amplifiers and attenuators. Also discussed are the measurement of T1 using two-pass techniques, and the possibility of using these phenomena in a practical application to optical logic circuitry. (Author)
AD-713 339

INTEGRATED FOCAL PLANE IRRADIANCE PATTERNS FOR GAUSSIAN BEAMS FOCUSED THROUGH CIRCULAR ANNULAR APERTURES.
Technical rept. 1 May-15 Jul 70,
Air Force Weapons Lab Kirtland AFB N Mex
Dale A. Holmes. Oct 70, 41p Rept no. AFWL-TR-70-102

Descriptors: (*Light, *Diffraction), Orifices, Distribution functions, Integrals.
Identifiers: Gaussian beams.

The diffraction of Gaussian light beams by circular apertures is considered. The far field or focal plane irradiance patterns are calculated and integrated over circular areas. The results of the irradiance integrations are displayed in graphical form using dimensionless coordinates. Using the Fresnel diffraction integral, it is analytically proved that the total beam power passing through the focal plane is exactly equal to the beam power transmitted by the aperture. (Author)
AD-713 728 HC$3.00 MF$0.65

STOKES PARAMETERS FOR QUANTUM SYSTEMS,
Army Electronics Command Fort Monmouth N J Atmospheric Sciences Lab
For primary bibliographic entry see Field 20J.
AD-713 732

DETERMINATION OF ATMOSPHERICALLY INDUCED PHASE FLUCTUATIONS BY LONG-DISTANCE INTERFEROMETRY AT 6328 A,
Army Electronics Command Fort Monmouth N J Inst for Exploratory Research
R. G. Buser, and G. K. Born. 10 Feb 70, 7p
Revision of report presented at the Annual Meeting (1969), Optical Society, Chicago, Ill., Oct 69.
Availability: Pub. in Jnl. of the Optical Society of America, v60 n8 p1079-1084 Aug 70.

Descriptors: (*Light transmission, Atmosphere), (*Light communication systems, Feasibility studies), Interferometers, Atmospheric motion, Phase shift, Gas lasers.
Identifiers: Tatarskian correlation function, Helium neon lasers.

Experimental values of atmospherically induced phase fluctuations have been obtained for various path lengths, using a near-ground horizontal Mach-Zehnder setup at 6328A. Independent determination of the structure-function constant of the refractive index C (n) and other relevant parameters permitted a clear definition of prevailing meteorological conditions. For low turbulence, or strong turbulence and short path length, Tatarski's theory generally underestimates the values of the observed rms phase fluctuations. For higher turbulence, no continuous phase information is directly obtainable, and the concept of phase structure function becomes experimentally undefined. (Author)
AD-713 817

LOW TEMPERATURE THERMOLUMINESCENCE IN LiF,
Wisconsin Univ., Madison. Dept. of Physica.
Ervin B. Podogorsak, and John R. Cameron. 1969, 19p

Descriptors: (*Lithium fluorides, Thermoluminescence), Dosimetry, Photons, Single crystals, Ionizing radiation.
Identifiers: Thermoluminescent dosimetry.

For abstract, see NSA 24 20.
COO-1105-161 HC$3.00 MF$0.65

PRODUCTION OF PLASMAS BY LONG-WAVELENGTH LASERS,
Princeton Univ., N.J. Plasma Physics Lab.
For primary bibliographic entry see Field 20I.
For abstract, see NSA 24 20.
MATT-786 HC$3.00 MF$0.65

CALCULATION OF FOCAL POINT CHARACTERISTICS IN OPTICAL SYSTEMS THAT PRODUCE SPECIAL IMAGES, AS WELL AS FOR A THICK LENSE WITH TWO ASPHERICAL PLANES.
Berechnung Der Brennpunktscharakteristiken Optischer Systeme, Welche Spezielle Abbildungen Vermitteln, Sowie Fuer Eine Dicke Linse Mit Zwei Asphaerischen Flaechen
Eidgenossische Technische Hochschule, Zurich (Switzerland).
W. Gehret. 1969, 120p DISS-4343
Lang- in German Spon- Supported in Part By Natl. Fund of Switz.

Descriptors: *Focusing, *Imaging techniques, *Lens design, *Optical properties, Functional analysis, Geometry, Optical paths.

For abstract, see STAR 08 21.
N70-38580 HC$3.00 MF$0.65

FRACTIONAL FRINGE HCN LASER-INTERFEROMETER,
Oak Ridge National Lab., Tenn.
J. N. Olsen. Aug 70, 14p*

Descriptors: (*Gas lasers, *Interferometers), Hydrogen cyanide, Microwave frequencies.
Identifiers: *Hydrogen cyanide lasers.

For abstract, see NSA 24 20.
ORNL-TM-3092 HC$3.00 MF$0.65

20G. Particle Accelerators

ON THE PROPAGATION OF HIGH INTENSITY, RELATIVISTIC ELECTRON BEAMS,
Army Missile Command Redstone Arsenal Ala
For primary bibliographic entry see Field 20I.
AD-713 576 HC$3.00 MF$0.65

PHOTON MONOCHROMATOR USING COMPTRON-SCATTERED GAMMA RAYS,
Ames Lab., Iowa.
J. E. Hall, R. G. Struss, and D. J. Zaffarano. Jul 70, 55p
Contract W-7405-eng-82

Descriptors: (*Gamma rays, Monochromators), Photonuclear reactions, Radioactive isotopes, Gamma emission, Proton beams, Neutron absorption.

For abstract, see NSA 24 20.
IS-2335 HC$3.00 MF$0.65

DEVELOPMENT OF A PLASMATRON ION SOURCE IN SLIT GEOMETRY FOR AN ELECTROMAGNETIC MASS SEPARATOR.
Entwicklung Einer Plasmatronionenquelle in Schlitzgeometrie Fuer Einen Elektromagnetischen Massentrenner
Osterreichische Studiengesellschaft Fur Atomenergie G.M.B.H., Seibersdorf (Austria). Physikinst.
H. Winter. Apr 70, 85p SGAE-PH-93/1970
Lang- in German

Descriptors: *Ion extraction, *Ion sources, *Isotope separation, *Plasmatrons, Gas ionization, Mass distribution, Slits.

For abstract, see STAR 08 21.
N70-38586 HC$3.00 MF$0.65

CALCULATED RESIDUAL RADIATION LEVELS FOR SOME ELEMENTS USED IN CYCLOTRON STRUCTURES,
Oak Ridge National Lab., Tenn.
C. B. Fulmer, and G. Kindred. Aug 70, 28p
Contract W-7405-eng-26

Descriptors: (*Cyclotrons, Particle accelerator targets), (*Particle accelerator targets, *Radiation hazards), Particle beams, Radiation shielding, Gamma rays.

For abstract, see NSA 24 20.
ORNL-TM-2834 HC$3.00 MF$0.65

TRANSPORT/360: A COMPUTER PROGRAM FOR DESIGNING CHARGED PARTICLE BEAM TRANSPORT SYSTEMS,
Stanford Linear Accelerator Center, Calif.
Karl L. Brown, and Sam K. Howry. Jul 70, 394p
Contract AT (04-3)-515

Descriptors: (*Particle accelerators, Design), (*Particle beams, Computer programs), Electron optics, Transport theory, Electron beams, Flow charting, Manuals, Magnetic fields, Alignment.
Identifiers: Stanford linear accelerator, TRANSPORT/360 computer program.

For abstract, see NSA 24 20.
SLAC-91 HC$3.00 MF$0.65

STUDY OF A MULTIELEMENT REGENERATIVE EXTRACTION SYSTEM FOR THE BERKELEY 184-INCH CYCLOTRON,
California Univ., Berkeley. Lawrence Radiation Lab.
Arthur C. Paul. May 70, 18p
Contract W-7405-eng-48

Descriptors: (*Synchrocyclotrons, Extractors), Vectors (Mathematics), Perturbation theory, Computer programming, Matrices (Mathematics), Particle trajectories.
Identifiers: LeCouteur matrices, REGEN computer program.

For abstract, see NSA 24 20.
UCRL-19804 HC$3.00 MF$0.65

20H. Particle Physics

LONG RANGE CORRECTIONS TO THE COULOMB POTENTIAL AND THEIR IMPLICATIONS ABOUT WEAK INTERACTIONS,
Institute for Advanced Study Princeton N J
Shau-Jin Chang, and R. Rajaraman. Feb 69, 15p
Grant AF-AFOSR-1365-68
Sponsored in part by National Science Foundation, Washington, D. C.

Descriptors: (*Photons, Interactions), (*Neutrinos, Pair production), Nuclear forces, Nuclear scattering, Mass spectra, Quantum mechanics, Field theory, Matrix algebra, Integrals.
Identifiers: Lamb shift, Form factors, *Weak interactions, Coulomb potential.

The document contains calculated corrections to the photon propagator due to the creation of virtual neutrino pairs. These are shown to result in long range (1/r cubed and 1/r to the 5th power type) corrections to the Coulomb potential. It is shown that these corrections are of significance because upper limits on their strengths lead to upper limits on Lambda, the weak interaction cutoff, and on possible nonconservation of the muquantum number. A discussion is given of these upper limits as obtained from the present accuracy of Lamb shift measurements. (Author)
AD-713 108 HC$3.00 MF$0.65

HIGH-RESOLUTION ELECTRON AND GAMMA-RAY STUDIES AND CONVERSION-COEFFICIENT MEASUREMENTS IN 132 Xe,
Aerospace Research Labs Wright-Patterson AFB Ohio
H. K. Carter, J. H. Hamilton , J. C. Manthuruthil, J. J. Pinajian, and E. F. Zganjar. 23 May 69, 19p
Rept no. ARL-70-0218V
Availability: Pub. in The Physical Review C, v1 n2 p649-665 Feb 70.

Descriptors: (*Iodine, Gamma emission), (*Gamma-ray spectra, Measurement), Nuclear spins, Nuclear energy levels, Parity, Least squares method, Xenon.
Identifiers: Xenon 132, Iodine 132.

The gamma-ray spectrum from the decay of 132I was measured with small- and large-volume, high-resolution Ge (Li) detectors, and 116 transitions were assigned in its decay. Selected regions of the conversion-electron spectrum were measured with an iron double-focusing spectrometer. The K-conversion coefficient of the 772-keV transition that was measured relative to the K-conversion coefficient of the 662-keV transition in 137Ba was used to normalize the electron and gamma spectra to obtain the K-conversion coefficients of the 262.7-, 284.7-, 505.9-, 522.6-, 621.0-, 630.2-, 650.6-, 669.8-, 671.5-, 727.1-, 809.8-, 812.3-, 954.6-, 1136.0-, 1143.4-, 1173.2-, 1372.1-, and 1398.6-keV transitions. Conversion coefficients of additional transitions were obtained from electron intensities of other work. From these conversion coefficients, each of the above transitions was assigned an M1 and/or E2 multipolarity. (Author)
AD-713 392

NEUTRON ACTIVATION CROSS SECTIONS FOR SOME ISOTOPES OF RUTHENIUM, PALLADIUM, INDIUM, TIN, AND IRIDIUM,
Ballistic Research Labs Aberdeen Proving Ground Md
Judith K. Temperley, and Donald E. Barnes. Aug 70, 38p Rept no. BRL-1491

Descriptors: (*Neutron activation, Neutron cross sections), Proton reactions, Gamma emission, Isotopes, Half life, Decay schemes, Tables, Ruthenium, Palladium, Indium, Tin, Iridium.

Fast-neutron activation cross sections for isotopes of ruthenium, palladium, indium, tin, and iridium have been measured relative to the 56Fe (n,p)56Mn cross section. Powdered metallic samples of natural-isotopic-abundance Ru, Pd, In, Sn, and Ir were irradiated with (14.1 plus or minus 0.5) - MeV neutrons. The activities produced were determined by observing the gamma radiation with a Ge (Li) detector. The experimental values obtained for (n,2n) and (n,p) reactions are compared with the predictions of recently developed empirical and semi-empirical equations, and the usefulness of these equations is discussed. (Author)
AD-713 404 HC$3.00 MF$0.65

CHERENKOV RADIATION IN HIGH-ENERGY PHYSICS. PART I. CHERENKOV RADIATION IN ISOTROPIC AND ANISOTROPIC MEDIA: THEORY AND EXPERIMENTAL VERIFICATION,
National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.
V. P. Zrelov. 1970, 257p SFCSI-AEC (TT-70-50003/1), TT-70-50003/1
Trans. of mono. Izluchenie Vavilova-Cherenkova i ego Primenenie v Fizike Vysokikh Energii. Pt. 1, Moscow, 1968 287p, by Y. Oren.

Descriptors: (*Cerenkov radiation, Cerenkov counters), Quantum theory, Magnetic moments, Nuclear spins, Magnetic dipoles, Crystals, Plasmas (Physics), High energy particles, Reviews, Translations, USSR.

Volume I of the review deals with the theory of the Cherenkov effect. The classical Tamm--Frank theory of the Cherenkov radiation in an isotropic medium is presented in detail. The quantum theory of Cherenkov radiation, first developed by Ginzburg, and the inverse Cherenkov effect, investigated by Tamm, are presented. The main features of the radiation in isotropic and anisotropic media and their experimental verification are discussed in detail, as are some problems of the radiation in anisotropic media. This review is intended for those studying experimental high energy physics, and will be of interest to physicists investigating the Cherenkov effect.
AEC-tr-7099/1 HC$3.00 MF$0.65

PHYSICS DIVISION SUMMARY REPORT. ANNUAL REVIEW 1 Apr 68-31 Mar 69.
Argonne National Lab., Ill.
1970, 227P
Contract W-31-109-eng-38

Descriptors: (*Nuclear physics, Reviews), Neutron reactions, Nuclear magnetic resonance, Nuclear shell models, Gamma rays, Particle accelerators, Matrix theory, Elementary particle theories.

For abstract, see NSA 24 20.
ANL-7620 HC$3.00 MF$0.65

EXPERIMENTS ON PARITY NON-CONSERVATION IN NUCLEAR FORCES,
California Inst. of Tech., Pasadena.
J. C. Vanderleeden, and F. Boehm. 1969, 24p
CONF-690958-1
Contract AT (04-3)-63
Presented at the Conference on Nuclear and Elementary Particle Physics, Brighton (England) 24-26 Sep 69.

Descriptors: (*Nuclear binding energy, Parity), Nuclear energy levels, Weak interactions, Decay schemes, Nuclear scattering.

For abstract, see NSA 24 20.
CALT-63-121 HC$3.00 MF$0.65

TIME REVERSAL INVARIANCE IN THE ELECTROMAGNETIC INTERACTION,
California Inst. of Tech., Pasadena.
Clemens A. Heusch. 1970, 35p CONF-700325-1
Contract AT (11-1)-68
Presented at the International Conference on Electromagnetic Interactions (5th), Moriond (France) 9-21 Mar 70.

Descriptors: (*Electromagnetic interactions, Parity), Strong interactions, Weak interactions, Elementary particle theories.
Identifiers: Charge parity violoations.

For abstract, see NSA 24 20.
CALT-68-264 HC$3.00 MF$0.65

THE DOLLY FILM MEASURING SYSTEM,
Illinois Univ., Urbana. Dept. of Physics.
For primary bibliographic entry see Field 18D.
For abstract, see NSA 24 20.
COO-1195-192 HC$3.00 MF$0.65

BACKWARD neutral f meson PRODUCTION IN positive pion d yields pp positive pion negative pion AT 4.19 GeV/c,
Illinois Univ., Urbana. Dept. of Physics.
B. Eisenstein, and H. Gordon. Jul 70, 12p

Descriptors: (*Pions, *Meson reactions), Deuteron reactions, Protons, Wave functions.

For abstract, see NSA 24 20.
COO-1195-194 HC$3.00 MF$0.65

STUDY OF DELTA ++ PRODUCTION IN TWO PRONGED positive pion proton INTERACTIONS AT 13.1 GeV/c,
Purdue Univ., Lafayette, Ind.
J. H. Scharenguivel, H. R. Barton, Jr., L. J. Gutay, S. L. Kramer, and S. Lichtman. 1969, 13p CONF-700806-26
Presented at the International Conference on High Energy Physics (15th), Kiev (USSR). Aug 70.

Descriptors: (*Pions, Particle interactions), (*Protons, Particle interactions), Photoproduction, Nuclear energy levels, Bubble chambers.

For abstract, see NSA 24 20.
COO-1428-232 HC$3.00 MF$0.65

DEEXCITATION PROCESSES IN NUCLEAR REACTIONS.
Progress rept. May 69-Apr 70,
Purdue Univ., Lafayette, Ind. Dept. of Chemistry.
Norbert T. Porile. May 70, 39p
Contract AT (11-1)-1505

Descriptors: (*Proton reactions, Excitation), Fission products, Alpha particle reactions, Neutrons.

For abstract, see NSA 24 20.
COO-1505-42 HC$3.00 MF$0.65

RESEARCH PROGRAM IN HIGH ENERGY ACCELERATOR PHYSICS A AND LOW LEVEL COUNTING ELEMENTARY PARTICLE PHYSICS.
Technical rept. 1 Oct 69-30 Sep 70,
Case Western Reserve Univ., Cleveland, Ohio.
William R. Frisken, Thomas L. Jenkins, Charles R. Sullivan, William M. Smith, and Alan G. Strelzoff. Jun 70, 23p
Contract AT (11-1)-1749

Descriptors: (*Elementary particles, Research projects), Proton reactions, Neutron reactions, Pions, Kaons.
Identifiers: Charge exchange reactions.

For abstract, see NSA 24 20.
COO-1749-18 HC$3.00 MF$0.65

LEVEL DEGENERACY OF THE GENERALISED N-PARTICLE DUEL AMPLITUDE WITH SATELLITES,
Chicago Univ., Ill.

R. J. Rivers. Jul 70, 16p EFI-70-37
Contract AT (11-1)-264

Descriptors: (*Elementary particle theories, Set theory), Exponential functions.
Identifiers: Duality (Elementary particles), Scattering amplitudes.

For abstract, see NSA 24 20.
COO-264-551 HC$3.00 MF$0.65

OPERATORIAL CONSTRUCTION OF MULTIPLE CHARGED PION AMPLITUDES,
Chicago Univ., Ill.
Jorge F. Willemsen. Jul 70, 22p EFI-70-39
Contract AT (11-1)-264

Descriptors: (*Pions, Meson scattering), Regge poles, Nuclear magnetic resonance.
Identifiers: Chiral symmetry.

For abstract, see NSA 24 20.
COO-264-552 HC$3.00 MF$0.65

eta-3 pion DECAY WITH SUSSKIND'S MODEL,
Chicago Univ., Ill.
Yoshio Miyatake. Jul 70, 17p EFI-70-40
Contract AT (11-1)-264

Descriptors: (*Pions, Decay schemes), Weak interactions, Strong interactions, Matrix theory.

For abstract, see NSA 24 20.
COO-264-553 HC$3.00 MF$0.65

NO-GO THEOREMS FOR DUAL MODELS,
Syracuse Univ., N. Y. Dept. of Physics.
A. P. Balachandran, L. N. Chang, and P. H. Frampton. Jul 70, 14p EFI-70-41
Contract AT (11-1)-264
Prepared in cooperation with Tata Inst. of Fundamental, Bombay (India), and Chicago Univ., Ill. Enrico Fermi Inst.

Descriptors: (*Elementary particle theories, Nuclear models), Regge poles, Nuclear spins, Nuclear energy levels.
Identifiers: Duality (Elementary particles).

For abstract, see NSA 24 20.
COO-264-554 HC$3.00 MF$0.65

PHASE-SPACE VOLUME OF ANGULAR CORRELATIONS FOR REACTIONS OF THE TYPE A + B (arrow) C + D + E FOR THE CASE OF ARBITRARY PARTICLE MASSES,
Los Alamos Scientific Lab., N. Mex.
V. K. Susienko. Aug 70, 4p
Trans. of Joint Inst. for Nuclear Research, Dubna (USSR) JINR-P2-4914 1970, by Helen Dahlby.

Descriptors: (*Nuclear reactions, Correlation), Kinetic theory, Translations, USSR.

For abstract, see NSA 24 20.
LA-tr-70-15 HC$3.00 MF$0.65

COMPTON CURRENT IN PRESENCE OF FIELDS FOR LEMP 1,
Los Alamos Scientific Lab., N. Mex.
H. J. Longley. 5 Jan 70, 33p
Contract W-7405-eng-36

Descriptors: (*Compton effect, Particle trajectories), Differential equations, Computer programming, Tables (Data), Electron scattering.
Identifiers: LEMP 1 computer code.

For abstract, see NSA 24 20.
LA-4348 HC$3.00 MF$0.65

FISSION CROSS SECTIONS FROM POMMARD,
Los Alamos Scientific Lab., N. Mex.
P. A. Seeger. 8 Apr 70, 159p
Contract W-7405-eng-36

Descriptors: (*Fission cross sections, Tables (Data)), Neutron flux, Radioactive isotopes, Data reduction.

For abstract, see NSA 24 20.
LA-4420 HC$3.00 MF$0.65

THEORETICAL AND EXPERIMENTAL RESEARCH ACTIVITIES IN HIGH ENERGY PHYSICS.
Progress rept. Sep 68-May 70.
Pennsylvania Univ., Philadelphia. Dept. of Physics.
1970, 61P
Contract AT (30-1)-2171

Descriptors: (*High energy particles, Nuclear reactions), Weak interactions, Strong interactions, Nuclear structure, Matrix theory, Kaons.
Identifiers: Charge parity violations.

For abstract, see NSA 24 20.
NYO-2171-310 HC$3.00 MF$0.65

MULTIVARIABLE EXPANSION OF THE SCATTERING AMPLITUDE INVOLVING AN ARBITRARY NUMBER OF SPINLESS PARTICLES AND CROSSING SYMMETRY FOR PARTIAL WAVES,
Syracuse Univ., N.Y. Dept. of Physics.
M. Modjtehedzadeh. Feb 70, 45p SU-1206-222

Descriptors: (*Elementary particles, Nuclear scattering), Nuclear spins, Differential equations.
Identifiers: Sum rules, Scattering amplitude.

For abstract, see NSA 24 20.
NYO-3399-222 HC$3.00 MF$0.65

RESEARCH PROGRAM IN ELEMENTARY PARTICLE THEORY.
Progress rept. for the period ending 31 Aug 70.
Syracuse Univ., N.Y. Dept. of Physics.

1970, 31P SU-1206-226
Contract AT (30-1)-3399

Descriptors: (*Elementary particle theories, Research), Regge poles, Protons, Electrons, Inelastic scattering, Weak interactions, Electromagnetic interactions.
Identifiers: Chiral symmetry.

For abstract, see NSA 24 20.
NYO-3399-226 HC$3.00 MF$0.65

STUDY OF Y*sub1 (1385)pion PRODUCTION NEAR THE Y*sub0 (1520) RESONANCE,
Massachusetts Univ., Amherst.
Shu-bon Chan, and D. Berley. Apr 70, 5p CONF-700416-6
Presented at the International Conference on Hyperon Resonances, Durham, N.C. Prepared in cooperation with Yale Univ., New Haven, Conn., and Brookhaven National Lab., Upton, N.Y.

Descriptors: (*Mesons, Production), Nuclear energy levels, Nuclear magnetic resonance, Nuclear spins, Bubble chambers.
Identifiers: *Resonance particles.

For abstract, see NSA 24 20.
NYO-3651-13 HC$3.00 MF$0.65

SINGLE PHOTOPRODUCTION OF NEUTRAL PI MESONS OF HYDROGEN IN THE EXTREME FORWARD DIRECTION AT 4 AND 5.8 GE V.
Deutsches Elektronen-synchrotron, Hamburg (West Germany).
M. Braunschweig, W. Braunschweig, D. Husmann, K. Luebelsmeyer, and D. Schmitz. Jan 70, 35p DESY-70/1

Descriptors: *Hydrogen, *Photoproduction, *Pions, Mesons, Nuclear reactions, Photons.

For abstract, see STAR 08 21.
N70-38030 HC$3.00 MF$0.65

SCATTERING THEORY FOR STRONG AND ELECTROMAGNETIC INTERACTIONS OF RELATIVISTIC TWO-PARTICLE SYSTEMS.
Deutsches Elektronen-synchrotron, Hamburg (West Germany).
G. Schierholz. Mar 70, 18p DESY-70/12

Descriptors: *Electromagnetic interactions, *Relativistic particles, Hamiltonian functions, Invariance, Lorentz transformations, Scattering cross sections.

For abstract, see STAR 08 21.
N70-38031 HC$3.00 MF$0.65

LORENTZ-INVARIANT LOCALIZATION FOR ELEMENTARY SYSTEMS. PART 3 - ZERO-MASS SYSTEMS.
International Centre for Theoretical Physics, Trieste (Italy).
A. J. Kalnay. Oct 69, 21p IC/69/134
Subm- Submitted for Publication

Descriptors: *Invariance, *Lorentz transformations, *Neutrinos, *Photons, *Position (location), Quantum mechanics, Relativistic theory.

For abstract, see STAR 08 21.
N70-38671 HC$3.00 MF$0.65

TIME DELAY OF SCATTERING PROCESSES. PART 2 - POLARIZATION DEPENDENCE.
International Centre for Theoretical Physics, Trieste (Italy). Laboratoire de Physique Theorique Et des Hautes Energies, Orsay (France).
J. L. Agudin. Jan 70, 27p IC/70/6
Theoret. Phys. Date- Jan. 1970 Coll- 27 P Refs Subm- Submitted for Publication Spon- Sponsored in Part By French Govt. Prep- Prepared Jointly With Intern. Centre for Theoret. Phys.

Descriptors: *Particle collisions, *Polarized electromagnetic radiation, *Time lag, *Wave reflection, Electromagnetic scattering, Phase shift, Refractivity.

For abstract, see STAR 08 21.
N70-38672 HC$3.00 MF$0.65

LOW-ENERGY WEAK SINGLE-PION PRODUCTION BY CURRENT COMMUTATORS.
International Centre for Theoretical Physics, Trieste (Italy).
N. Paver, E. E. Radescu, and C. Verzegnassi. Oct 69, 37p IC/69/127
Subm- Submitted for Publication

Descriptors: *Commutators, *Particle production, *Pions, Kinematics, Leptons, Multipoles, P waves, S waves, Sum rules.

For abstract, see STAR 08 21.
N70-38679 HC$3.00 MF$0.65

ON THE RENORMALIZATION OF THE REGGEIZED FEYNMAN AMPLITUDES.
International Centre for Theoretical Physics, Trieste (Italy).
H. Sugawara. Jan 70, 8p IC/70/2
Subm- Submitted for Publication Spon- Sponsored By Sakko-kai Found.

Descriptors: *Elementary particles, *Feynman diagrams, *Normalizing (statistics), *Nuclear scattering, *Regge poles, *Scalars, Divergence, Loops, Particle mass.

For abstract, see STAR 08 21.
N70-38680 HC$3.00 MF$0.65

CURRENT COMMUTATORS, DISPERSION RELATIONS AND K SUB L3 FORM FACTORS.
International Centre for Theoretical Physics, Trieste (Italy).
E. E. Radescu. Nov 69, 27p IC/69/141
Subm- Submitted for Publication

Descriptors: *Commutators, *Form factors, *K-mesons, *Momentum transfer, *Sum rules, Covariance, Current algebra, Dispersing, Field theory (algebra), Kaons, Pions.

For abstract, see STAR 08 21.
N70-38820 HC$3.00 MF$0.65

THE RHO MESON IN LOW-ENERGY PION-NUCLEON SCATTERING.
International Centre for Theoretical Physics, Trieste (Italy).
J. C. Huang, and J. R. Urani. Nov 69, 20p
IC/69/138
Subm- Submitted for Publication Spon- Sponsored in Part By Univ. of Missouri Res. Council

Descriptors: *Meson-nucleon interactions, *Nucleon-nucleon scattering, *Nucleons, *Pions, *Scattering coefficients, Current algebra, Distance, Feynman diagrams, Form factors, Mesons, P waves, S waves.

For abstract, see STAR 08 21.
N70-38821 HC$3.00 MF$0.65

NON-POLYNOMIAL LAGRANGIAN THEORIES.
International Centre for Theoretical Physics, Trieste (Italy).
A. Salam. Feb 70, 32p IC/70/7
Conf- Presented At the Coral Gables Conf., Miami, Fla., 23-25 Jan. 1970, and the Intern. Winter School on Theoret. Phys., Schladming, Austria, Feb. 1970

Descriptors: *Lagrange multipliers, *Normalizing (statistics), *Polynomials, Dyson theory, Elementary particles, S matrix theory.

For abstract, see STAR 08 21.
N70-38932 HC$3.00 MF$0.65

THE ACCURACY OF THE INOPIN- ERICSON THEORY OF NUCLEAR DIFFRACTION SCATTERING.
International Centre for Theoretical Physics, Trieste (Italy).
A. Y. Abul-magd, and M. H. Simbel. Dec 69, 15p
IC/69/143
Subm- Submitted for Publication Spon- Sponsored in Part By Ford Found.

Descriptors: *Elastic scattering, *Nuclear particles, *Scattering cross sections, Angular momentum, Coulomb collisions, Diffraction, Formulas (mathematics), Nuclear scattering.

For abstract, see STAR 08 21.
N70-38990 HC$3.00 MF$0.65

SPONTANEOUS BREAKDOWN OF CONFORMAL SYMMETRY.
International Centre for Theoretical Physics, Trieste (Italy).
C. J. Isham, A. Salam, and J. Strathdee. Jan 70, 9p
IC/70/3
Subm- Submitted for Publication

Descriptors: *Baryons, *Conformal mapping, *Electromagnetic fields, Field theory (algebra), Gauge invariance, Lagrange multipliers, Lorentz transformations.

For abstract, see STAR 08 21.
N70-38991 HC$3.00 MF$0.65

REST FRAME SUM RULES FROM QUARK MODEL AND FIELD ALGEBRA.
International Centre for Theoretical Physics, Trieste (Italy).
G. J. Komen, and S. Pallua. Dec 69, 38p IC/69/147
Subm- Submitted for Publication Spon- Sponsored in Part By Neth. Organ. for Advan. of Pure Res.

Descriptors: *Extrapolation, *Field theory (algebra), *Quarks, *Sum rules, Current algebra, Elastic scattering, S matrix theory, Vector currents.

For abstract, see STAR 08 21.
N70-38992 HC$3.00 MF$0.65

NEUTRON ELASTIC-AND INELASTIC-SCATTERING CROSS SECTIONS FOR Na IN THE RANGE OF 5.4 to 8.4 MeV,
Oak Ridge National Lab., Tenn.
F. G. Perey, and W. E. Kinney. Aug 70, 64p
Contract W-7405-eng-26

Descriptors: (*Sodium isotopes, *Neutron cross sections), Scattering cross sections, Elastic scattering, Inelastic scattering.

For abstract, see NSA 24 20.
ORNL-4518 HC$3.00 MF$0.65

RESEARCH PROGRAM IN ELEMENTARY PARTICLE THEORY.
Progress rept.,
Texas Univ., Austin. Dept. of Physics.
E. C. G. Sudarshan. 1969, 24p
Contract AT (40-1)-3992

Descriptors: (*Elementary particle theories, Research), Nuclear scattering, Regge poles, Field theory (Physics), Weak interactions, Electromagnetic interactions.

For abstract, see NSA 24 20.
ORO-3992-17 HC$3.00 MF$0.65

THE PARITY FORBIDDEN DECAY OF THE 8,88 MeV16O STATE,
Washington Univ., Seattle.
E. M. Henley, T. E. Keliher, and D. U. L. Yu. Apr 70, 8p

Descriptors: (*Oxygen, Nuclear energy levels), (*Weak interactions, Selection rules (Physics)), Parity, Pions, Alpha decay.

For abstract, see NSA 24 20.
RLO-1388-569 HC$3.00 MF$0.65

MESON DYNAMICS AND THE NUCLEAR MANY-BODY PROBLEM,
Washington Univ., Seattle.
W. D. Brown, R. D. Puff, and L. Wilets. 1968, 68p

Descriptors: (*Mesons, Many body problem), Nucleons, Elementary particle interactions, Field theory (Physics), Greens function, Hartree-Fock approximation.

For abstract, see NSA 24 20.
RLO-1388-573 HC$3.00 MF$0.65

SEARCH FOR AN EXCITED PROLATE ROTATIONAL BAND IN28Si,
Oregon Univ., Eugene. Dept. of Physics.
F. C. P. Huang, E. F. Gibson, and D. K. McDaniels. 1970, 31p

Descriptors: (*Silicon isotopes, *Nuclear energy levels), Photonuclear reactions, Nuclear magnetic resonance, SU3 theories.
Identifiers: Silicon 28.

For abstract, see NSA 24 20.
RLO-1925-34 HC$3.00 MF$0.65

PHASE BAND ANALYSIS OF positive pion-proton SCATTERING AT 2.5 TO 3.0 GeV/c,
Oregon Univ., Eugene.
David Bridges, Michael J. Moravcsik, and Akihiko Yokosawa. 1970, 14p CONF-700806-25
Presented at the International Conference on High Energy Physics (15th), Kiev (USSR) 26 Aug-4 Sep 70. Prepared in cooperation with Argonne National Lab., Ill.

Descriptors: (*Protons, Resonance scattering), (*Pions, Resonance scattering), Nuclear energy levels, Elastic scattering, Phase shift.

For abstract, see NSA 24 20.
RLO-2041-37 HC$3.00 MF$0.65

ENERGY TRANSFER FROM A LARGE AMPLITUDE WHISTLER WAVE TO AN ELECTROSTATIC MODE BY TRAPPED PARTICLE INSTABILITY,
Stevens Inst. of Tech., Hoboken, N.J. Dept. of Physics.
G. Schmidt, and P. Palmadesso. Apr 70, 10p
Contract AT (30-1)-3785

Descriptors: (*Charged particles, Particle trajectories), Electric fields, Magnetic fields, Cyclotron resonance, Equations of motion, Whistlers.

For abstract, see NSA 24 20.
SIT-3785-11 HC$3.00 MF$0.65

BACKWARD PHOTOPRODUCTION OF neutral pion MESSONS AT 6 TO 18 GeV,
Stanford Linear Accelerator Center, Calif.
Donald H. Tompkins. Jul 70, 105p
Contract AT (04-3)-515

Descriptors: (*Pions, *Photoproduction), Meson scattering, Regge poles, Electron scattering, Proton scattering, Nuclear structure.

For abstract, see NSA 24 20.
SLAC-109 HC$3.00 MF$0.65

EFFECT OF A TRANSVERSE MOMENTUM DISTRIBUTION IN THE PATRON MODEL,
Syracuse Univ., N.Y. Dept. of Physics.
C. W. Gardiner, and D. P. Majumdar. Apr 70, 31p
NYO-3399-225

Descriptors: (*Leptons, Inelastic scattering), (*Nucleons, Inelastic scattering), Protons, Invariance, Distribution functions.
Identifiers: *Partons.

For abstract, see NSA 24 20.
SU-1206-225 HC$3.00 MF$0.65

ON THE BINDING ENERGY OF A LAMBDA-PARTICLE IN NUCLEAR MATTER,
New Mexico State Univ., University Park. Dept. of Physics.
B. Ram, and W. Williams. 1970, 18p

Descriptors: (*Lambda hyperons, Nuclear binding energy), Elementary particle interactions, Nuclear energy levels, Nuclear spins, Scattering cross sections.
Identifiers: Bethe formula.

For abstract, see NSA 24 20.
TID-25487 HC$3.00 MF$0.65

ANNUAL REPORT (ON HIGH ENERGY PHYSICS),
California Univ., Riverside.
A. Kernan, and R. T. Poe. May 70, 19p
Contract AT (04-2)-34

Descriptors: (*Elementary particle interactions, Technical reports), Bubble chambers, Photoproduction.
Identifiers: Duality (Elementary particles).

For abstract, see NSA 24 20.
UCR-34-P-107-104 HC$3.00 MF$0.65

DUAL RESONANCE MODELS FOR VECTOR CURRENTS,
California Univ., Berkeley. Lawrence Radiation Lab.
J. H. Weis. 6 May 70, 75p CONF-700806-27
Contract W-7405-eng-48
Presented at the International Conference on High Energy Physics (15th), Kiev (USSR). Aug 70.

Descriptors: (*Regge poles, Nuclear models), Nuclear magnetic resonance, Weak interactions, Strong interactions, Electromagnetic interactions.

For abstract, see NSA 24 20.
UCRL-19780 HC$3.00 MF$0.65

CENTRIFUGAL BARRIER EFFECTS IN MESON DECAYS,
California Univ., Berkeley. Lawrence Radiation Lab.
C. Quigg, and F. von Hippel. May 70, 15p CONF-700525-6
Contract W-7405-eng-48
Presented at the Experimental Meson Spectroscopy Conference, Philadelphia, Pa. May 70.

Descriptors: (*Mesons, Decay schemes), (*Meson resonances, Nuclear radiation spectroscopy), Nuclear spins, Regge poles.

For abstract, see NSA 24 20.
UCRL-19826 HC$3.00 MF$0.65

THE SEARCH FOR Z*'s,
California Univ., Berkeley. Lawrence Radiation Lab.
Gerson Goldhaber. Jun 70, 19p CONF-700416-7
Contract W-7405-eng-48
Presented at the International Conference on Hyperon Resonances, Durham, N.C. May 70.

Descriptors: (*Elementary particles, SU3 theories), Nuclear magnetic resonance, Kaons, Deuterons, Photonuclear reactions, Elastic scattering.
Identifiers: *Resonance particles.

For abstract, see NSA 24 20.
UCRL-19832 HC$3.00 MF$0.65

A COMPUTER PROGRAM FOR THE SMOOTHING AND DIFFERENTIATION OF DATA FROM MULTICHANNEL ANALYZERS,
California Univ., Berkeley. Lawrence Radiation Lab.
For primary bibliographic entry see Field 18D.
For abstract, see NSA 24 20.
UCRL-19903 HC$3.00 MF$0.65

AN ANALYSIS OF A PROPOSED n-a SCATTERING EXPERIMENT,
California Univ., Livermore. Lawrence Radiation Lab.
W. C. Dickinson, E. M. Lent, and C. D. Bowman.
1 Apr 70, 88p

Descriptors: (*Neutron scattering, Neutron cross sections), Fast neutrons, Thermal neutrons, Neutron flux, Distribution functions.

For abstract, see NSA 24 20.
UCRL-50848 HC$3.00 MF$0.65

AN ATTEMPT TO ASSIGN NEUTRON RESONANCE SPINS IN 235U BY CAPTURE GAMMA RAY MULTIPLICITY MEASUREMENTS,
California Univ., Livermore. Lawrence Radiation Lab.
C. D. Bowman, B. L. Berman, and G. D. Sauter. 25 May 70, 8p

Descriptors: (*Uranium 235, Nuclear fission), (*Neutrons, Nuclear spins), Nuclear magnetic resonance, Neutron absorption, Gamma emission.

For abstract, see NSA 24 20.
UCRL-50881 HC$3.00 MF$0.65

MEASUREMENT OF PION PION INELASTIC SCATTERING CROSS-SECTION IN THE REGION OF 1 GeV INVARIANT MASS,
European Organization for Nuclear Research, Geneva (Switzerland).
D. D. Hyams, W. Beusch, and A. D. Johnson.
1970, 18p CONF-700525-5
Presented at the Experimental Meson Spectroscopy Conference, Philadelphia, Pa. Apr 70. Prepared in cooperation with Eidgenoessische Technische Hochschule, Zurich (Switzerland), and Hawaii Univ., Honolulu.

Descriptors: (*Pions, *Inelastic scattering), Scattering cross sections, Strong interactions.

For abstract, see NSA 24 20.
UH-511-74-70 HC$3.00 MF$0.65

TWO OVERLAPPING GROUP-TRANSPORT APPROXIMATION FOR THERMAL NEUTRON PROBLEMS,
Bettis Atomic Power Lab., Pittsburgh, Pa.
M. Natelson, and E. M. Gelbard. May 70, 19p
CONF-700608-18
Contract AT (11-1)-GEN-14
Presented at the American Nuclear Society Meeting, Los Angeles, Calif. 28 Jun-2 Jul 70.

Descriptors: (*Thermal neutrons, Neutron flux), Transport theory, Monte Carlo method, Eigenvalues.

For abstract, see NSA 24 20.
WAPD-T-2341 HC$3.00 MF$0.65

20I. Plasma Physics

SOLENOIDS EXCITED AT RADIO-FREQUENCIES IN THE PRESENCE OF PLASMAS.
Final rept. Sep 67-Dec 69,
Arnold Engineering Development Center Arnold Air Force Station Tenn
J. A. Sprouse. Oct 70, 31p Rept no. AEDC-TR-70-206
Contract F40600-71-C-0002
Prepared in cooperation with ARO, Inc., Tullahoma, Tenn., Rept. no. ARO-ETF-TR-70-184.

Descriptors: (*Plasma medium, *Solenoids), Radiofrequency generators, Induction heating, Transformers, Electromagnetic fields, Coils.
Identifiers: Plasma diagnostics.

The rf-excited coil in the presence of a plasma is examined in terms of a transformer model and also in terms of the distortion of the electromagnetic fields which is produced by the induced eddy-currents in the plasma. The treatment of rf coils presented here can be applied to either the plasma diagnostics regime or to the generation of the rf electrodeless discharge. Although the calculations of the electric and magnetic fields in this report are for a cylindrically symmetric coil immersed in a uniform, linear plasma, neither the model nor the approach to the problem is limited to these cases. (Author)
AD-713 104 HC$3.00 MF$0.65

PARTICLE FLUX ASSOCIATED WITH STOCHASTIC PROCESSES,
Stanford Univ Calif Inst for Plasma Research
C. E. Newman, P. A. Sturrock, and E. Tademaru.
17 Sep 70, 11p Rept no. SU-IPR-386
Contract F44620-69-C-0008, Grant NGL-05-020-272

Descriptors: (*Charged particles, Density), Partial differential equations, Solar wind, Astrophysics, Plasma medium, Stochastic processes.
Identifiers: Random processes, Stochastic acceleration, Fokker-Planck equation, Particle flux.

The Lagrange expansion, which may be used to derive the Fokker-Planck equation, is here to derive the corresponding expression for the flux of particles subject to a stochastic scattering process. The coefficients which occur in this expression are, in general, not the same as the coefficients which occur in the Fokker-Planck equation itself. In the special case that the particle distribution involves only one independent variable, the particle flux is determined by the familiar Fokker-Planck coefficients. Evaluation of particle flux is of special interest in the study of stochastic acceleration. (Author)
AD-713 124 HC$3.00 MF$0.65

SELECTED PAPERS PRESENTED AT THE HIGH-PRESSURE ARC SYMPOSIUM SPONSORED BY THE AMERICAN PHYSICAL SOCIETY ON 28 AND 29 OCTOBER 1969.
Final rept.,
Aerospace Research Labs Wright-Patterson AFB Ohio
A. M. Hunter, II. Aug 70, 278p* Rept no. ARL-70-0135
Presented at the 1969 High-Pressure Arc Symposium of the Annual Gaseous Electronics Conference (22nd) on 28-29 Oct 69, Gatlinburg, Tenn.

Descriptors: (*Plasma physics, *Symposia), Plasma medium, Electric arcs, Transport properties, Thermodynamics, Electrical conductance, Thermal conductivity, Argon, Hydrogen, Nitrogen, Magnetic fields, Vortices, Electrodes, High-pressure research.

Contents: Spectral characteristics of arcs; Transport and thermodynamic properties; Arc characteristics; Arcs in flow and magnetic fields; Time varying arcs; and Electrode effects.
AD-713 131 HC$3.00 MF$0.65

ON THE THEORY OF POLARIZATION TRANSFER IN INHOMOGENEOUS MAGNETIZED PLASMAS,
Stanford Univ Calif Inst for Plasma Research
Y. C. Chin, and P. C. W. Fung. Aug 70, 23p Rept no. SU-IPR-378
Contract F44620-69-C-0008, Grant NGR-05-020-272

Descriptors: (*Plasma medium, Electromagnetic waves), (*Electromagnetic waves, Polarization), Transfer functions, Astrophysics, Wave functions, Magnetic fields, Magneto-optic effect, Phase shift, Differential equations.
Identifiers: Electromagnetic radiation, Magnetoionic mode coupling.

The theory of polarization transfer in an inhomogeneous magnetized plasma medium is extended to include the effects of the modecoupling phenomenon. The resultant system of polarization transfer equations is analyzed for several special cases of interest. (Author)
AD-713 151 HC$3.00 MF$0.65

CONSOLIDATED QUARTERLY REPORT FOR THE PERIOD OCTOBER 1, 1969 TO DECEMBER 31, 1969.
Utah Univ Salt Lake City Microwave Device and Physical Electronics Lab
For primary bibliographic entry see Field 20E.
AD-713 157 HC$3.00 MF$0.65

CONSOLIDATED QUARTERLY REPORT FOR THE PERIOD JULY 1, 1969 TO SEPTEMBER 30, 1969.
Utah Univ Salt Lake City Microwave Device and Physical Electronics Lab
For primary bibliographic entry see Field 20E.

AD-713 158 HC$3.00 MF$0.65

TAETIGKEITSBERICHTE 1969. FACHGEBIET 4: ANTRIEBE UND ENERGETIK (Activity Report 1969. Division 4: Propulsion and Energy Technique),
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Porz-Wahn (West Germany)
For primary bibliographic entry see Field 21E.
AD-713 210

FINAL REVIEW REPORT.
Rept. for 1 Sep 63-1 Sep 69,
California Inst of Tech Pasadena
Roy W. Gould, Amnon Yariv, and Robert S. Harp. 31 Aug 70, 37p
Contract Nonr-220 (50)
Continuation of Contract Nonr-220 (13).

Descriptors: (*Plasma physics, Reports), (*Lasers, Semiconductor devices), (*Gallium arsenides, *Electrooptics), Plasma oscillations, Cyclotron resonance phenomena, Electron beams, Infrared radiation, Gas discharges, Lead compounds, Tellurides, Neon, Argon, Afterglows, Resonators.
Identifiers: Semiconductor junctions, Plasma diagnostics, Semiconductor lasers, Lead tellurides.

Research under the Contract generally covered the following areas: Plasma wave resonances in spatially non-uniform plasmas; Cyclotron and upper hybrid echo phenomena in plasmas; Plasma wave echoes; Cyclotron harmonic waves in plasmas; Resonance cones in anisotropic plasmas; Recombination radiation from forward biased p-n junctions; Electro-optic effect; Infrared absorption in gallium arsenide; and Modes in optical resonators with gain. The report contains a summary of research. (Author)
AD-713 228 HC$3.00 MF$0.65

SEPARATION AND MAGNETOHYDRODYNAMICS,
Cornell Univ Ithaca N Y
John Buckmaster. 29 Jan 69, 21p AROD-5329:18-M
Contract DA-31-124-ARO (D)-325
Prepared in cooperation with University Coll., London (England). Revision of report dated 9 Sep 68.
Availability: Pub. in Jnl. of Fluid Mechanics, v38 pt3 p481-498 1970.

Descriptors: (*Magnetohydrodynamics, Boundary layer), Magnetic fields, Reynolds number, Separation, Stagnation point, Fluid flow, Viscosity, Wake, Plasma medium, Navier-Stokes equations, Integration, Numerical analysis.
Identifiers: Viscous wake, Numerical integration.

The paper is an investigation of MHD boundary layers in a transverse magnetic field when the magnetic Reynolds number (Rm) is small. The main purpose is to understand something about the suppression of separation by a strong magnetic field, with particular emphasis on the behaviour near a rear stagnation point. Given an O (1) inviscid flow it is shown that there is a critical value of N, the interaction parameter, to completely suppress separation. This value is one half that proposed by Leibovich (1967), a discrepancy that is due to the nonregularity of the boundary-layer equations at a rear stagnation point, a possibility that Leibovich did not consider in his solution. Model linear equations suggest the true role of Leibovich's solution. The possibility of a viscous wake leaving the rear stagnation point is considered and it is suggested that one does not arise from vorticity generated in the boundary layer. (Author)
AD-713 281

MAGNETODYNAMIQUE DES FLUIDES SANS INERTIE (Inertialess Magnetodynamics of Fluids),
Cornell Univ Ithaca N Y
For primary bibliographic entry see Field 20D.
AD-713 297

PROBE ANALYSIS OF MOVING STRIATIONS IN IODINE,
Queen'S Univ Belfast (Northern Ireland) Dept of Physics
J. R. M. Coulter, K. G. Emeleus, E. W. Gray, and G. A. Woolsey. 27 Jun 69, 12p ARL-70-0214W
Grant AF-EOAR-42-67
Availability: Pub. in Proceedings of the Royal Irish Academy, v69 sectA n6 p77-83, 26 Mar 70.

Descriptors: (*Gas discharges, Plasma oscillations), (*Iodine, Ionization), Wave transmission, Electric fields, Langmuir probes, Electrons, Ions, Plasma sheath, Great Britain.
Identifiers: Plasma striations.

An analysis has been made of closely spaced low frequency moving striations in an iodine positive column at a pressure of 0.2 torr for currents of 1 to 6 mA using a dynamic single probe method. The column was partly constricted. The positive and negative ion concentrations appeared to be some two or more orders of magnitude greater than the electron concentrations. The individual striation plasmas were nearly equipotential. Phase differences were recorded between axial maxima of electron concentration and electron temperature. An off-axis maximum in electron concentration was found for the larger currents and correlated with a reversal of the radial electric field indicated from the striation shape. Sources of uncertainty in the results are noted. (Author)
AD-713 323

PLASMA BEHAVIOR IN A TOROIDAL HIGH-beta DEVICE,
Air Force Cambridge Research Labs L G Hanscom Field Mass
Charles C. Gallagher, Lewis S. Combes, and Morton A. Levine. 3 Feb 70, 10p Rept no. AFCRL-70-0517
Revision of report dated 6 Aug 69.
Availability: Pub. in The Physics of Fluids, v13 n6 p1617-1625 Jun 70.

Descriptors: (*Plasma medium, Magnetic pinch), Magnetic fields, Turbulence, Containment, Stability.
Identifiers: Plasma devices, Magnetic mirrors, Plasma diagnostics.

The stability of a cusp magnetic field has been combined with the low loss of a closed field configuration in a series of three small toroidal devices designed for plasma containment. In operation, a pinch partly stabilized by an axial magnetic field, is produced prior to application of the containing cusp field. The axial stabilizing field of the pinch is then trapped by the plasma so that closed field lines are maintained within the plasma while the cusp is excluded from the plasma. There is no evidence of turbulence and the device exhibits a loss rate an order of magnitude below that to be expected from the same device operated as a minimum-B configuration without field trapping. Containment time is dependent on the decay rate of the applied cusp field. Maximum value of Beta within the plasma exceeds 2 and Beta remains above 1 for 15 micro sec. Electron densities and temperatures exceed 10 to the 16th power/cc and 1000,000 degrees K respectively. (Author)
AD-713 362

ON THE RE-CONNEXION OF MAGNETIC FIELD LINES IN CONDUCTING FLUIDS,
California Univ San Diego La Jolla Dept of Applied Physics and Information Science
Tyan Yeh, and W. Ian Axford. 8 Jul 69, 24p
AROD-5133:281-P
Availability: Pub. in Jnl. Plasma Physics, v4 pt2 p207-229 1970.

Descriptors: (*Magnetohydrodynamics, Magnetic fields), Two-dimensional flow, Partial differential equations, Equations of motion.

The reconnexion of magnetic field lines is described for a special case of steady, incompressible hydromagnetic flow in two dimensions. A similarity solution is obtained which corresponds to the flow of a perfectly conducting, inviscid fluid such that magnetic field lines are carried from two sides toward, then on the other two sides away from, the centre of an X-configuration. The effects of viscosity are important in shocks which form in the vicinity of the X-lines of the configuration. The effects of finite electrical conductivity must be taken into account near the centre of the configuration which, in the symmetrical case discussed, is an X-type neutral point. From an approximate solution valid in this region it is found that the fluid must flow from the larger to the smaller wedges of the X-configuration. Hence, the reconnexion process is such that oppositely directed magnetic field lines move towards the neutral point in the larger wedges, become reconnected at the neutral point, and move away in the smaller wedges. Since the solution in the vicinity of the neutral point appears to be no more than a response to the external flow, which is in turn controlled by conditions far from the neutral point and is essentially unaffected by viscosity and finite electrical conductivity, it is tentatively concluded that the rate of re-connexion of magnetic field lines does not depend on these quantities, and that, in general, re-connexion can be expected to take place rapidly if circumstances are favourable. (Author)
AD-713 410

ASYMPTOTIC THEORY OF NONLINEAR WAVE MOTIONS IN MAGNETOHYDRODYNAMICS. PART I. SURFACE WAVES.
Technical summary rept.,
Wisconsin Univ Madison Mathematics Research Center
M. C. Shen. Jan 70, 36p Rept no. MRC-TSR-1041
Contract DA-31-124-ARO (D)-462

Descriptors: (*Magnetohydrodynamics, Wave functions), Nonlinear systems, Magnetic fields, Partial differential equations, Asymptotic series, Perturbation theory, Boundary value problems.
Identifiers: *Surface waves.

A tractable asymptotic theory is developed for the study of nonlinear wave motions of a conducting fluid in a variable magnetic field subject to the constraints of some fixed bounding surfaces. (Author)
AD-713 439 HC$3.00 MF$0.65

PENETRATION OF PHOTONS THROUGH A HOT ELECTRON GAS.
Final rept.,
Mathematical Applications Group Inc White Plains N Y
S. Hui, M. H. Kalos, H. Steinberg, and E. Troubetzkoy. Jun 70, 64p Rept no. MR-7006
DASA-2556
Contract DASA01-69-C-0150

Descriptors: (*Plasma medium, Electrons), (*Photons, Penetration), Compton scattering, Thermal radiation, Monte Carlo method, Programming (Computers), Scattering.
Identifiers: Maxwell-Boltzmann density function, Electron gas, XPLASMA computer code.

The work reported here is the first phase of the study of improved techniques for determining the time-dependent history of a radiation field. A standard problem of the penetration of a Planck spectrum of photons through a hot electron gas is solved by the Monte Carlo technique. A code to calculate the energy and angular spectrum of transmitted radiation was written in which no attempt was made to include stimulated scattering or any other non-linear effects. Such non-linear ef-

fects will be included in the second phase of this study and the calculations here will be repeated. Results for several spectra at different temperatures and a medium of an electron gas of temperature between 0-20 Kev are given. (Author)
AD-713 485 HC$3.00 MF$0.65

ON THE PROPAGATION OF HIGH INTENSITY, RELATIVISTIC ELECTRON BEAMS,
Army Missile Command Redstone Arsenal Ala
Thomas G. Roberts. 1970, 13p

Descriptors: (*Plasma medium, Electron beams), (*Electron beams, Magnetic pinch), Gas discharges, Magnetic fields, Ion accelerators, X-ray tubes, Ionization, Interactions, Magnetohydrodynamics.
Identifiers: Alfven waves, Magnetohydrodynamic waves.

Intense beams of relativistic electrons have been extracted from the electrode space of flash X-ray machines and projected into plasma columns and drift spaces. In the plasma columns the beam pinches itself and propagates to a target at the end of the discharge. The plasma column is produced by a conventional pinch discharge in argon and the magnetic field of the plasma column is sufficient to guide the high energy beam around rather sharp curves with little loss of energy. In addition to the very interesting properties of the beam itself, and its applications in thermonuclear work, the possibility of using these beams for a relatively inexpensive, ion accelerator which may produce intense pulses of heavy ions with energies as high as 10 to the 12th power eV per nucleon has recently stimulated research. It is the purpose of the paper to describe the principal experimental results so far obtained, and to derive an expression for the maximum current which a beam may possess by use of the Bennett theory and the equilibrium current distribution which the beam must assume. It will also be shown that this expression reduces to the Alfven limit in a frame in which the beam's space charge is fully neutralized, and indicates that beams which exceed the Alfven limit may be expected to propagate in the laboratory frame. (Author)
AD-713 576 HC$3.00 MF$0.65

KINEMATICS OF DIFFUSION, FLUIDS AND PLASMA BY CONTINUOUS MOVEMENT AND FINITE VELOCITIES,
Deseret Test Center Fort Douglas Utah
For primary bibliographic entry see Field 20D.
AD-713 588 HC$3.00 MF$0.65

STROSSBESTIMMTE GRENZSCHICHT IN EINEM SCHWACH IONISIERTEN PLASMA (Impact-Determined Boundary Layer in a Weakly Ionized Plasma),
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Stuttgart-Vaihingen (West Germany)
Karl Gerhard Mueller, and Peter Wahle. 3 Nov 69, 15p Rept no. DFVLR-Sonderdruck-51
Text in German; attached summary in English.
Availability: Pub. in Zeitschrift fuer Naturforschung, v25a n4 p525-538 1970. No copies furnished.

Descriptors: (*Plasma sheath, *Boundary layer), Impact, Equations of motion, West Germany.

A collision-dominated sheath model is developed which includes the well known macroscopic models as extreme cases. A description of the charge carriers is given. In order to fulfil the microscopic boundary conditions at the wall the velocity distributions are divided into two parts. A basic set of new transport equations arises which differ from the usual equations by a correction term in the momentum transfer equations. Because of this splitting up of the velocity distribution one is able to take into account exactly specular reflection of the electrons at the wall. In a good approximation the results can also be obtained from the usual equations, if a suitably fitted factor is introduced into the electron boundary condition at the wall. (Author)
AD-713 651

TEMPERATURE MEASUREMENTS IN FDL 50-MEGAWATT ELECTROGASDYNAMIC FACILITY.
Final rept.,
Plasma Sciences Labs Inc Van Nuys Calif
H. N. Olsen, F. L. Kelly, and G. Bedjai. Oct 70, 26p AEDC-TR-70-238
Contract F40600-69-C-0007

Descriptors: (*Plasma jets, Temperature), Arc heaters, Test facilities.

Temperatures in the free stream of a 50 MW electrogasdynamic test facility were determined from experimentally measured radial intensity profiles of the electron continuum. Static plasma pressures were 10 and 20 atm in flowing air and measured temperatures ranged from 3800K to 5400K. A spectral probe defined by the optical path of a 1/4 meter grating spectrograph and focussing lens was traversed across the shock cone of the plasma before and after insertion of test samples. Calibration curves for the detector were used for relating the measured intensity to temperature. The results indicate that the nitric oxide concentration in the plasma is lower than the equilibrium value expected at these temperatures. (Author)
AD-713 672 HC$3.00 MF$0.65

SCATTERING BY IMPERFECTLY CONDUCTING SPHERES,
Harvard Univ Cambridge Mass Cruft Lab
For primary bibliographic entry see Field 20N.
AD-713 678 HC$3.00 MF$0.65

PROPOSAL FOR A SHOCK-HEATED TOROIDAL Z-PINCH EXPERIMENT,
Los Alamos Scientific Lab., N. Mex.
James A. Phillips. Nov 69, 8p
Contract W-7405-eng-36

Descriptors: (*Plasmas (Physics), Pinch effect), (*Pinch devices, Design criteria), Toroids, Stability, Plasma diagnostics, Magnetic fields.

For abstract, see NSA 24 20.
LA-4352 HC$3.00 MF$0.65

NUMERICAL SIMULATION OF THE WEIBEL INSTABILITY IN ONE AND TWO DIMENSIONS,
Los Alamos Scientific Lab., N. Mex.
R. L. Morse, and C. W. Nielson. Apr 70, 21p
Contract W-7405-eng-36

Descriptors: (*Plasma diagnostics, Simulation), Electromagnetic waves, Radiation belts, Dispersion relations, Distribution functions, Stability.
Identifiers: Weibel instability.

For abstract, see NSA 24 20.
LA-4482 HC$3.00 MF$0.65

PRODUCTION OF PLASMAS BY LONG-WAVELENGTH LASERS,
Princeton Univ., N.J. Plasma Physics Lab.
John M. Dawson. Jun 70, 6p CONF-700615-1
Contract AT (30-1)-1238
Presented at the Fluid and Plasma Dynamics Conference (3rd), Los Angeles, Calif. 29 Jun-1 Jul 70.

Descriptors: (*Plasmas (Physics), Heating), Carbon dioxide lasers, Plasma interactions, Plasma diagnostics, Laser beams, Pinch effect.
Identifiers: *Laser produced plasmas, Neodymium glass lasers.

For abstract, see NSA 24 20.
MATT-786 HC$3.00 MF$0.65

ON THE FLOW OF COMPRESSIBLE PLASMAS IN THE SELF-INDUCED MAGNETIC FIELD OF ARC-DISCHARGES.
Zur Stroemung Kompressibler Plasmen Im Eigenfeld Von Lichtbogenentladungen
Deutsche Forschungs- Und Versuchsanstalt Fuer Luft- Und Raumfahrt, Stuttgart (West Germany). Inst. Fuer Plasmadynamik.
H. Huegel. Apr 70, 119p DLR-FB-70-13
Lang- in German, English Summary

Descriptors: *Axisymmetric flow, *Compressible flow, *Ohmic dissipation, *Resistance heating, Arc discharges, Channels, Differential equations, Gas dynamics, Magnetic fields, Magnetohydrodynamic flow.

For abstract, see STAR 08 21.
N70-38669 HC$3.00 MF$0.65

BATTELLE INFORMATION NUMBER I.
Battelle Inst., Frankfurt Am Main (West Germany).
For primary bibliographic entry see Field 20E.
For abstract, see STAR 08 21.
N70-38876 HC$3.00 MF$0.65

FLUSH-MOUNTED ELECTROSTATIC PROBE IN THE PRESENCE OF NEGATIVE IONS,
Sandia Labs., Albuquerque, N. Mex.
For primary bibliographic entry see Field 14B.
For abstract, see NSA 24 20.
SC-RR-70-413 HC$3.00 MF$0.65

EXPERIMENTAL INVESTIGATION OF CUSPED CONTAINMENT GEOMETRIES CHALICE.
Annual rept. 1 Sep 69-31 Aug 70,
Stevens Inst. of Tech., Hoboken, N.J. Dept. of Physics.
George J. Yevick, and Robin Harvey. 1970, 108p SIT-255
Contract AT (30-1)-2582

Descriptors: (*Plasmas (Physics), Containment), Performance, Lasers, Pinch effect, Plasma diagnostics.
Identifiers: Chalice project.

For abstract, see NSA 24 20.
SIT-2582-34 HC$3.00 MF$0.65

SPATIAL DAMPING OF LARGE AMPLITUDE PLASMA WAVES,
Stevens Inst. of Tech., Hoboken, N.J. Dept. of Physics.
A. Lee, and G. Schmidt. Dec 69, 25p SIT-245
Contract AT (30-1)-3785

Descriptors: (*Plasma oscillations, Damping), Distribution functions, Particle trajectories, Equations of motion.
Identifiers: Landau damping.

For abstract, see NSA 24 20.
SIT-3785-10 HC$3.00 MF$0.65

QUARTERLY PROGRESS REPORT OF 1969 ON PLASMA RESEARCH (1ST), JANUARY 1-MARCH 31, 1969.
California Univ., Berkeley. Electronics Research Lab.

1970, 45P
Contract AT (11-1)-34

Descriptors: (*Plasmas (Physics), Research), Plasma density, Plasma diagnostics, Stability, Electric fields.

For abstract, see NSA 24 20.
UCB-34-P-128-11 HC$3.00 MF$0.65

QUARTERLY PROGRESS REPORT OF 1969 ON PLASMA RESEARCH (2ND), APRIL 1-JUNE 30, 1969.
California Univ., Berkeley. Electronics Research Lab.
1970, 120P
Contract AT (11-1)-34

Descriptors: (*Plasmas (Physics), Research), Electromagnetic properties, Stability, Containment, Correlation, Simulation.

For abstract, see NSA 24 20.
UCB-34-P-128-12 HC$3.00 MF$0.65

INTERACTION OF RELATIVISTIC ELECTRON BEAMS WITH PLASMA. THE PROBLEM OF CRITICAL CURRENTS (Vzaimodeistvie Relyativistskikh Elektronnykh Puchkov s Plasmoi i Problema Kriticheskikh Tokov),
California Univ., Livermore. Lawrence Radiation Lab.
L. S. Bogdankevich, and A. A. Rukhadze. Jan 70, 62p
Trans. of Akademiya Nauk SSSR. Fizicheskii Institut Report (USSR) Preprint-6 58p 1970.

Descriptors: (*Plasmas (Physics), Electron beams), (*Electron beams, Interactions), Plasma devices, Thermonuclear reactions, Energy transfer, Translations, USSR.

For abstract, see NSA 24 20.
UCRL-Trans-10470 HC$3.00 MF$0.65

20J. Quantum Theory

ESTIMATE OF POTENTIAL SURFACE FOR K-Cl-Cl.
Purdue Univ Lafayette Ind Project Squid Headquarters
For primary bibliographic entry see Field 7D.
AD-713 123 HC$3.00 MF$0.65

RESEARCH IN GENERAL RELATIVITY.
Final rept.,
Pittsburgh Univ Pa Dept of Physics
Ezra T. Newman, and Allen I. Janis. Aug 70, 169p
ARL-70-0136
Contract F33615-70-C-1081

Descriptors: (*Relativity theory, Equations of motion), (*Groups (Mathematics), Relativity theory), Transformations (Mathematics), Topology, Field theory, Matrix algebra, Integral equations, Tensor analysis, Vector analysis, Partial differential equations.
Identifiers: *General relativity, Lorentz groups, Spherical harmonics.

The report discusses work in three areas of research connected with general relativity: The development of trapped surfaces; A new approach to equations of motion; and Some applications of group theory to general relativity, in particular to equations of motion. (Author)
AD-713 140 HC$3.00 MF$0.65

SOME APPLICATIONS OF DETAILED BALANCING,
Joint Inst for Lab Astrophysics Boulder Colo
Ludwig Oster. 5 Dec 69, 11p AROD-4445:170-P
Contract DA-31-124-ARO (D)-139
Revision of report dated 27 Oct 69.
Availability: Pub. in American Jnl. of Physics, v38 n6 p754-761 Jun 70.

Descriptors: (*Quantum statistics, Astrophysics), Thermodynamics, Supernovae, Kinetic theory.
Identifiers: Cosmology, Maxwell-Boltzmann density function, Thermodynamic equilibrium, Stellar physics.

The principle of detailed balancing is used in a consistent manner to derive equilibrium distribution functions, such as the Maxwell-Boltzmann and Saha-Boltzmann distributions, and the Bose-Einstein and Fermi-Dirac distributions. The same technique is then applied to matter at very high temperatures at which radiation and elementary particles are in thermodynamic equilibrium, that is, to situations postulated in supernova explosions and the early stages of an evolutionary universe. (Author)
AD-713 234

CONSTANCY OF INERTIAL MASS IN A CENTRIFUGAL FIELD,
Virginia Univ Charlottesville Dept of Physics
J. W. Beams. 5 Mar 70, 7p AROD-4036:4-MC
Grant DA-ARO (D)-31-124-G996
Availability: Pub. in Physical Review Letters, v24 n15 p840-843, 13 Apr 70.

Descriptors: (*Mass-energy relation, Centrifugal fields), Nuclear binding energy, Inertia, Magnesium, Aluminum, Platinum, Gold, Relativity theory.

A search was made for a possible variation in the inertial mass of platinum with respect to that of magnesium produced by the application of a centrifugal field. No variation was found within an experimental uncertainty of 4 parts in 100,000 due to the application of a centrifugal field of 150,000 g or within 3 parts in 10 to the 10th power per g. (Author)
AD-713 253

SOLUTIONS OF THE EINSTEIN AND EINSTEIN-MAXWELL EQUATIONS,
Texas Univ Austin
R. P. Kerr, A. Schild, and G. C. Debney. 3 Apr 69, 15p ARL-70-0176W
Contract F33615-68-C-1675, Grant NSF-GP-8868
Prepared in cooperation with Virginia Polytechnic Inst., Blacksburg.
Availability: Pub. in Jnl. of Mathematical Physics, v10 n10 p1842-1854 Oct 69.

Descriptors: (*Field theory, Partial differential equations), Electromagnetic fields, Relativity theory, Gravity.
Identifiers: Gravitational fields, Einstein-Maxwell equations, Maxwells equations.

Algebraically degenerate solutions of the Einstein and Einstein-Maxwell equations are studied. Explicit solutions are obtained which contain two arbitrary functions of a complex variable, one function being associated with the gravitational field and the other mainly with the electromagnetic field. (Author)
AD-713 313

EINSTEIN TENSOR AND GENERALIZATIONS OF BIRKHOFF'S THEOREM,
Temple Univ Philadelphia Pa Dept of Physics
Hubert Goenner. 20 Jun 69, 16p ARL-70-0216W
Contract F33615-70-C-1027
Prepared in cooperation with Goettingen Univ. (West Germany). Inst. fuer Theoretische Physik.
Availability: Pub. in Communications in Mathematical Physics (West Germany), v16 p34-47 1970.

Descriptors: (*Relativity theory, Tensor analysis), Groups (Mathematics), Topology, Algebra, Theorems.
Identifiers: Birkhoff theorem, Canonical forms, Lie algebras, Metric spaces.

The Einstein tensors of metrics having a 3-parameter group of (global) isometries with 2-dimensional non-null orbits (G sub 3) (2, s/t) are studied in order to obtain algebraic conditions guaranteeing an additional normal Killing vector. It is shown that Einstein spaces with (G sub 3) (2, s/t) allow a G sub 4. A critical review of some of the literature on Birkhoff's theorem and its generalizations is given. (Author)
AD-713 320

PENETRATION OF PHOTONS THROUGH A HOT ELECTRON GAS.
Mathematical Applications Group Inc White Plains N Y
For primary bibliographic entry see Field 20I.
AD-713 485 HC$3.00 MF$0.65

DIFFICULTY AND POSSIBILITY OF KINETIC THEORY OF QUANTUM-MECHANICAL SYSTEMS. PART V. PARTICULAR AND GENERAL SOLUTIONS OF THE SCHRODINGER EQUATION AND THEIR SIGNIFICANCE IN KINETIC THEORY.
Research rept.,
Polytechnic Inst of Brooklyn N Y
Toyoki Koga. Aug 70, 33p Rept no. PIBAL-70-36
Contracts Nonr-839 (38), DAHC04-69-C-0077
See also Part 3/4, AD-711 681.

Descriptors: (*Quantum mechanics, Kinetic theory), Partial differential equations, Equations of motion, Invariance, Matrix algebra, Operators (Mathematics).
Identifiers: Paulis exclusion principle, Liouville equation, Schrodinger equation.

The quantum-mechanical Liouville equation is more restrictive and hence more informative than the Schrodinger equation, because the former already contains the definition of independent variable p, momentum in a special case. In this sense, the quantum-mechanical Liouville equation is more definitive as the description of a physical law, and is shown to be invariant under the Galilean transformation. By taking advantage of this convenience, the author obtains a particular solution of the Schrodinger equation for n-particle system. This solution is localized in the phase space and stable in time, and seems to represent an n-particle system as single system. The de Broglie wave is constructed by superposing a number of similar particular solutions for single-particle systems. Similarly, general solution is constructed for n-particle systems. For justification of its application to kinetic theory, Pauli's principle is analyzed and interpreted anew. The present solution promises the possibility of rational methods of kinetic theory of quantum-mechanical systems, as analogous to methods of classical kinetic theory. (Author)
AD-713 605 HC$3.00 MF$0.65

EXPERIMENTS ON GENERAL RELATIVITY AT LIQUID HELIUM TEMPERATURES AND IN ZERO MAGNETIC FIELDS.
Final technical rept. Feb 64-Nov 69,
Stanford Univ Calif
William M. Fairbank, and William O. Hamilton. Jul 70, 36p ARL-0264
Contract AF 33 (615)-1204

Descriptors: (*Nuclear spins, Gyroscopes), (*Relativity theory, Test methods), Magnetic fields, Helium, Superconductivity, Nuclear properties, Cryogenics, Feasibility studies.
Identifiers: Nuclear gyroscopes, *General relativity, Helium 3, Helium 4.

Research has been performed on a free precession nuclear gyroscope. A description of the proposed gyroscope is given. The technical progress toward such a device is discussed. (Author)
AD-713 633 HC$3.00 MF$0.65

STOKES PARAMETERS FOR QUANTUM SYSTEMS,
Army Electronics Command Fort Monmouth N J Atmospheric Sciences Lab
Edward Collett. 6 Nov 69, 12p
Availability: Pub. in American Jnl. of Physics, v38 n5 p563-574 May 70.

Descriptors: (*Quantum mechanics, Electromagnetic waves), Polarization, Zeeman effect, Wave functions, Light.
Identifiers: *Stokes parameters, Schrodinger equation, *Polarized electromagnetic radiation.

The classical Stokes polarization parameters are extended to treat quantum systems. This is accomplished by using the semiclassical radiation theory and considering only radiation by the dipole mechanism. The identification of the Stokes parameters with the density matrix elements is noted. The Stokes parameters for a number of familiar quantum systems which undergo dipole radiation are then calculated. (Author)
AD-713 732

SELF-ADJOINT ALGEBRAS OF UNBOUNDED OPERATORS,
Pennsylvania Univ., Philadelphia. Dept. of Physics.
Robert T. Powers. Jul 70, 15p
Contract AT (30-1)-2171

Descriptors: (*Field theory (Physics), Operators (Mathematics)), Functions (Mathematics), Linear algebra, Invariance, Hilbert space, Quantum theory, Algebra.

For abstract, see NSA 24 20.
NYO-2171-318 HC$3.00 MF$0.65

NONLINEAR EFFECTS IN QUANTUM ELECTRODYNAMICS. PHOTON PROPAGATION AND PHOTON SPLITTING IN AN EXTERNAL FIELD,
Pennsylvania Univ., Philadelphia. Dept. of Physics.
Z. Bialynicka-Birula, and I. Bialynicki-Burla.
1970, 21p
Contract AT (31-1)-3829

Descriptors: (*Quantum electrodynamics, Photons), Electromagnetic fields, Astrophysics, Lagrangian functions, Field theory (Physics).
Identifiers: Neutron stars.

For abstract, see NSA 24 20.
NYO-3829-54 HC$3.00 MF$0.65

THE GRAVITATIONAL RED SHIFT.
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
P. Eby. 16 Sep 69, 18p NASA-TM-X-53914, MSFC-IN-SSL-N-68-19

Descriptors: *Atomic clocks, *Red shift, *Relativistic theory, Electromagnetic fields, Gas masers, Gravitational fields, Mathematical models, Maxwell equation.

For abstract, see STAR 08 21.
N70-38145 HC$3.00 MF$0.65

S-MATRIX FOR GAUGE-INVARIANT FIELDS.
International Centre for Theoretical Physics, Trieste (Italy).
E. S. Fradkin, and I. V. Tyutin. Jan 70, 53p IC/70/1

Descriptors: *Field theory (physics), *Gauge invariance, *Gravitational fields, *S matrix theory, Coulomb potential, Feynman diagrams, Lagrange multipliers, Shell theory.

For abstract, see STAR 08 21.
N70-38487 HC$3.00 MF$0.65

NON-LINEAR REALIZATIONS. PART 3 - SPACE-TIME SYMMETRIES.
International Centre for Theoretical Physics, Trieste (Italy).
C. J. Isham, A. Salam, and J. Strathdee. Jan 70, 34p IC/70/5
Subm- Submitted for Publication

Descriptors: *Nonlinear systems, *Space-time functions, *Tensors, Bosons, Gravitons, Lie groups, Lorentz transformations, Symmetry.

For abstract, see STAR 08 21.
N70-38931 HC$3.00 MF$0.65

20K. Solid Mechanics

STRUCTURAL INFLUENCE COEFFICIENTS FOR A REDUNDANT SYSTEM INCLUDING BEAM-COLUMN EFFECTS: ANALYTICAL DEVELOPMENT AND COMPUTATIONAL PROCEDURE.
Technical rept.,
Aerospace Corp., El Segundo, Calif. Lab. Operations.
W. P. Rodden, E. F. Farkas, G. L. Commerford, and H. A. Malcom. 17 Apr 65, 381p TDR-469 (5240-10)-7 SSD-TR-65-114
Contract AF 04 (695)-469
Distribution Limitation now Removed.

Descriptors: (*Beams (Structural), Load distribution), Buckling (Mechanics), Elasticity, Deflection, Shear stresses, Deformation, Structural parts, Supports, Data processing systems, Programming (Computers), Input-output devices, Force (Mechanics), Punched cards, Torsion.
Identifiers: Columns (Supports).

A force method is presented for the solution of the internal load distribution, structural influence coefficients, and buckling characteristics of a redundant elastic beam system including beam-column effects. The formulation is general to the extent of considering each structural element to be subject to bending, torsion, shear, and axial deformations. An iterative procedure is developed for the analysis of the most general redundant case in which beam-column effects cause interaction between the external loading and the redundant internal reactions. The aerospace IBM 7090/7094 Computer Program No. ES 057A provides the solution for a system composed of as many as 50 structural elements having a degree of redundancy up to 25 and loaded at up to 50 control points. The internal load distribution may be determined for 20 sets of external loadings. In addition to the printed output, the structural influence coefficients are provided in a punched-card format suitable for use in vibration and aeroelastic analyses, and the final internal load distribution matrices may be provided in an optional punched-card format suitable for use in stress analysis. (Author)
AD-472 604 HC$3.00 MF$0.65

THE APPLICATION OF COMPUTER GRAPHICS TO MULTIHARMONIC ANALYSIS OF STRUCTURAL SHELLS.
Technical rept. Sep-Nov 68,
Air Force Flight Dynamics Lab Wright-Patterson AFB Ohio
Thomas N. Bernstein. Aug 70, 101p Rept no. AFFDL-TR-70-57

Descriptors: (*Structural shells, Loading (Mechanics)), (*Harmonic analysis, Programming (Computers)), Thermal stresses, Fourier analysis, Graphics, Subroutines.
Identifiers: *Computer graphics, Calcomp 563 plotters.

The report describes a technique, together with the associated computer subroutines required, for graphically displaying the structural response of a shell of revolution subjected to an arbitrary mechanical or thermal load represented by the sum of several Fourier harmonics. Solutions are presented for a typical problem. (Author)
AD-713 101 HC$3.00 MF$0.65

BOMS II, BUCKLING OF STIFFENED MULTILAYERED CIRCULAR CYLINDRICAL SHELLS WITH DIFFERENT ORTHOTROPIC MODULI IN TENSION AND COMPRESSION.
Technical rept. Mar-Aug 70,
Aerospace Corp San Bernardino Calif San Bernardino Operations
Robert M. Jones. 14 Aug 70, 74p Rept no. TR-0059 (S6825)-2 SAMSO-TR-70-339
Contract F04701-70-C-0059

Descriptors: (*Structural shells, *Buckling (Mechanics)), (*Aerospace craft, Structural properties), Stiffened cylinders, Composite materials, Compressive properties, Stresses, Strain (Mechanics), Computer programs.
Identifiers: FORTRAN, FORTRAN 4 programming language, BOMS 2 computer program, Cylindrical shells.

An exact buckling criterion, within the framework of classical buckling theory, is derived for eccentrically stiffened multilayered circular cylindrical shells made of materials that have different orthotropic moduli in tension and compression. Such behavior is typical of many current composite materials. The buckling criterion is valid for arbitrary combinations of axial and circumferential loading, including axial compression and internal pressure as well as axial tension and lateral pressure. The material model (stress-strain relationship) involves a bilinear stress-strain curve with a discontinuity in slope (modulus) at the origin. A numerical example of buckling of a ring-stiffened two-layered circular cylindrical shell is given to illustrate application of the buckling criterion. A FORTRAN IV computer program, BOMS II, that implements the aforementioned analysis is described and listed. (Author)
AD-713 113 HC$3.00 MF$0.65

SIMULATION WITH MINIMUM EQUIPMENT OF RANDOM VIBRATION INDUCED BY COMPLEX EXCITATION.
Technical rept.,
Houston Univ Tex Dept of Mechanical Engineering
O. E. Crenwelge, Jr., and D. Muster. Aug 70, 189p Rept no. TR-22
Contract Nonr-4492 (01)

Descriptors: (*Structural parts, Vibration), (*Aerospace craft, Structural properties), (*Vibration, Simulation), Loading (Mechanics), Damping, Cantilever beams, Metal plates, Response, Resonant frequency, Aerodynamic loading, Aerodynamic noise.
Identifiers: Spectrum analysis.

Complete simulation of random response induced in service by complex, ergodic, Gaussian excitation requires the exact reproduction of the response spectral densities at all points of the system and the cross-spectral densities between each pair of points. This in turn requires exact reproduction of the service loading. If a less-than-complete exact simulation of the response spectra at and between n system locations is acceptable, this can be accomplished using n discrete random forces. For certain types of systems previous theorization has shown that one discrete random force can be used to produce simulation which is accurate in the neighborhood of the resonance frequencies and approximate in the vicinity between resonance peaks. These systems must have light damping and widely spaced resonances so that modal coupling does not exist. The discrete random simulation force must have the appropriately shaped spectrum and must be properly located so that all modes will be excited. For systems of this type the theory shows that reproduction of the response spectral density at any one point assures reproduction of the spectral and cross-spectral densities at and between all other points. (Author)
AD-713 141 HC$3.00 MF$0.65

FORMAT-FORTRAN MATRIX ABSTRACTION TECHNIQUE. VOLUME VI. SUPPLEMENT I. DESCRIPTION OF DIGITAL COMPUTER PROGRAM. PHASE I. EXTENDED.
Final rept. 1 Jul 68-30 Jun 70,
Douglas Aircraft Co Long Beach Calif
R. C. Morris. Aug 70, 68p Rept no. DAC-33569-Vol-6-Suppl-1 AFFDL-TR-66-207-Vol-6-Suppl-1
Contract F33615-68-C-1633
See also Volume 6, AD-682 262 and Volume 7, AD-683 782.

Descriptors: (*Stresses, Programming (Computers)), (*Airframes, Structural properties), Matrix algebra, Subroutines, Force (Mechanics).
Identifiers: FORMAT computer program.

The FORMAT System has been updated by the incorporation of additional basic capability and the refinement of existing capability. A simpler mode of updating case data and extended force method matrix generation capability has been incorporated in Phase I of the system. A refined 'Structure Cutter' module, capabilities for matrix partitioning and instruction looping, and an additional eigenvalue/eigenvector extraction module have been incorporated in Phase II. Finally the limitations which existed in the matrix plotting capability in Phase III have been eliminated. Programming documentation for the extended capability of Phase I of the FORMAT System is presented in this report. (Author)
AD-713 149 HC$3.00 MF$0.65

TAETIGKEITSBERICHTE 1969. FACHGEBIET 3: FESTIGKEIT, WERKSTOFFE, BAUWEISEN (Activity Report 1969. Division 3: Strength, Materials, Construction Methods),
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Porz-Wahn (West Germany)
For primary bibliographic entry see Field 22B.
AD-713 209

ELASTIC-PLASTIC ANALYSIS OF SOME PRESSURE VESSEL HEADS,
California Univ Berkeley
E. P. Popov, M. Khojasteh-Bakht, and P. Sharifi.
29 Jul 69, 11p AROD-8284:1-A
Contract DAHC04-69-C-0037
Prepared in cooperation with Illinois Univ., Chicago. Dept. of Materials Engineering. Presented at the Winter Annual meeting of the American Society of Mechanical Engineers, Los Angeles, Calif., 16-20 Nov 69. Paper No. 69-WA/PVP-7.
Availability: Pub. in Jnl. of Engineering for Industry, Transactions of the ASME, p309-316 May 70.

Descriptors: (*Structural shells, Elasticity), (*Pressure vessels, Elasticity), Loading (Mechanics), Stresses, Buckling (Mechanics), Mathematical analysis.
Identifiers: Finite element analysis, Elastoplasticity.

Sixteen ASME standard torispherical heads attached to cylinders and subjected to internal pressure are analyzed as elastic and/or elastic-plastic shells using a new finite element. As basic elements, thin-walled frusta with curved meridians having common tangents and radii at the nodal circles are employed assuring good accuracy of the results. In the plastic analysis each wall-thickness was subdivided into concentric lamina in order to monitor the behavior of the material. The incremental law of plasticity in conjunction with the Mises yield condition and the associated flow rule were used in the inelastic range. The results of the analysis are presented in detail and are compared with the provisions of the ASME Pressure Vessel Code. (Author)
AD-713 258

STRAIGHT CRESTED WAVES IN AN INFINITE LINEAR VISCOELASTIC PLATE USING THE STANDARD LINEAR SOLID MODEL AND ASSUMING CONSTANT POISSON'S RATIO.
Technical rept.,
Watervliet Arsenal N Y
Struan Robertson. Oct 70, 22p Rept no. WVT-7052

Descriptors: (*Mechanical waves, Propagation), (*Viscoelasticity, Solids), Damping, Linear systems, Vibration, Numerical methods and procedures, Plastics.
Identifiers: *Polyisobutylene, Plates.

The problem of straight crested waves propagating in an infinite plate composed of a linear viscoelastic material is examined. It is found that, for the assumption of constant Poisson's ratio, the roots obtained for Rayleigh's characteristic equation for the infinite elastic plate can be used to determine the damping and frequency of oscillation in the viscoelastic case. The standard linear solid is used to represent the material's behavior in shear. A particular example is given for polyisobutylene. (Author)
AD-713 301 HC$3.00 MF$0.65

RESPONSE OF SELECTED MATERIALS TO HIGH-SPEED FRAGMENT IMPACT,
Army Engineer Waterways Experiment Station Vicksburg Miss
For primary bibliographic entry see Field 19D.
AD-713 513 HC$3.00 MF$0.65

THE ROLE OF FRACTURE TOUGHNESS AND RESIDUAL STRESSES IN THE FATIGUE AND FRACTURE BEHAVIOR OF LARGE THICK-WALLED PRESSURE VESSELS,
Watervliet Arsenal N Y
For primary bibliographic entry see Field 19F.
AD-713 519 HC$3.00 MF$0.65

LINEAR SUSPENSION SYSTEM PARAMETER IDENTIFICATION,
Army Tank Automotive Command Warren Mich
For primary bibliographic entry see Field 13E.
AD-713 546 HC$3.00 MF$0.65

A FINITE ELEMENT STRESS ANALYSIS OF A CRACK IN A BI-MATERIAL PLATE,
Illinois Univ Urbana Dept of Theoretical and Applied Mechanics
R. K. Leverenz. Jun 70, 64p Rept no. T/AM-331
Contract N00019-69-C-0289

Descriptors: (*Crack propagation, Composite materials), (*Cracks, *Stresses), Fracture (Mechanics), Loading (Mechanics), Metal plates, Structural properties, Numerical analysis, Computer programs, Theses.
Identifiers: Finite element analysis.

A stress analysis is obtained for the problem of a crack in one material of a bi-material plate located perpendicular to the material interface. A numerical solution is obtained using finite element techniques to obtain the force displacement relationships. Knowing this, a work integral method is used to determine the stress intensity factors for the crack. Since the work integral is independent of path, the path of integration can be chosen far enough away from the crack tip to avoid the complications of the crack tip singularity. The problem is studied for a number of cases where the crack length to plate width ratio, distance from crack tip to material interface, and the ratio of material constants were varied as parameters. (Author)
AD-713 593 HC$3.00 MF$0.65

BUCKLING AND POSTBUCKLING BEHAVIOR OF DISCRETELY STIFFENED THIN-WALLED CIRCULAR CYLINDERS,
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Brunswick (West Germany)
M. Esslinger, and B. Geier. 24 Nov 69, 10p Rept no. DFVLR-Sonderdruck-59
Availability: Pub. in Zeitschrift fuer Flugwissenschaften v18 n7 p246-253 1970. No copies furnished.

Descriptors: (*Structural shells, *Buckling (Mechanics)), Cylindrical bodies, Loading (Mechanics), Hydrostatic pressure, Torsion, Compressive properties, Failure (Mechanics), West Germany.
Identifiers: Translations, Cylindrical shells.

Experimental results on the buckling and postbuckling behavior of stiffened thin-walled circular cylinders with large spacing of the stiffeners are presented. It is pointed out that the postbuckling loads are considerably raised by the stiffening, if and only if the stiffeners are arranged such that the formation of a postbuckling pattern like that of the unstiffened cylinder is essentially disturbed. Particular attention is devoted to the torsional postbuckling patterns appearing at cylinders subjected to axial load or external hydrostatic pressure. (Author)
AD-713 628

WAVE PROPAGATION IN AN INFINITE ELASTIC PLATE IN CONTACT WITH AN INVISCID LIQUID LAYER.
Technical rept.,
Watervliet Arsenal N Y
W. W. Walter, and G. L. Anderson. 1970, 14p Rept no. WVT-7049
Availability: Pub. in Jnl. of the Acoustical Society of America, v47 n5 pt-2 p1398-1407 May 70.

Descriptors: (*Mechanical waves, Metal plates), (*Liquid rocket propellants, Oscillation), Hydrodynamics, Liquids, Elasticity, Surface properties, Containers.

The dispersion relation for straight-crested waves in an isotropic plate in a state of plane strain that is covered by a layer of an incompressible liquid is derived and investigated in the limits of very long wavelengths (thickness-stretch vibrations of the plate-liquid system) and of very short wavelengths (surface waves at the solid-liquid interface). In the case of surface waves, there are two dispersive modes, one predominantly elastic (analogous to Rayleigh waves) and the other essentially fluid, and in the thickness-stretch case there are an infinite number of essentially elastic modes and one fluid mode. An approximate version of the dispersion relation valid for arbitrary wavelengths is obtained by using two nonclassical plate theories to account for the extensional anf flexural deformations of the plate. This relation gives rise to five modes on the real branch, which are identified as being thickness-stretch, thickness-shear, flexural, extensional, and fluid in character, and three modes on the imaginary branch, namely, flexure, thickness-shear, and thickness-stretch. Two of the five cutoff frequencies are modified by the presence of the liquid layer. A variety of numerical results is presented in graphical form. (Author)
AD-713 635

UNTERSUCHUNG EINER ZYLINDERSCHALE UNTER ABSCHNITTSWEISE KONSTANTER DRUCKBELASTUNG MITTELS VERSCHIEDENER SCHALENTHEORIEN (Investigation, by Means of Various Shell Theories, of a Cylindrical Shell Subjected to Constant Radial Pressure),
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Muelheim An Der Ruhr (West Germany)
K. Schiffner. 16 Mar 70, 6p Rept no. DFVLR-Sonderdruck-57
Text in German; attached summary in English.
Availability: Pub. in Zeitschrift fuer Flugwissenschaften, v18 n7 p241-245 1970. No copies furnished.

Descriptors: (*Structural shells, Loading (Mechanics)), High-pressure research, Bending, Stresses, Cylindrical bodies, Elasticity, West Germany.
Identifiers: Cylindrical shells.

The classical shell theory of Love and the shear deformation shell theory of Naghdi and Reissner are applied to the problem of an infinite cylindrical shell subjected to a constant radial pressure on portion of length. The results calculated by both theories are in good agreement for thin shells. Larger differences occur for thick shells with concentrated radial pressure load (line load). (Author)
AD-713 641

ANALYTICAL PROCEDURES FOR PREDICTING THE MECHANICAL PROPERTIES OF FIBER REINFORCED COMPOSITES.
Wisconsin Univ Madison
For primary bibliographic entry see Field 11D.
AD-713 675 HC$3.00 MF$0.65

DIGITAL COMPUTER PROGRAM FOR APPROXIMATE STRESS-CONCENTRATION ANALYSIS FOR A NOZZLE IN A SPHERICAL PRESSURE VESSEL,
Newark Coll of Engineering N J Dept of Mechanical Engineering
Arnold Allentuch, and Eugene Golub. Sep 70, 32p
Rept no. NCE-NV-4
Contract N00014-67-A-0225-0001

Descriptors: (*Nozzles, Stresses), (*Stresses, Computer programs), Pressure vessels, Photoelasticity, Digital computers.
Identifiers: BRANS computer program.

A computer program is presented which gives the total stress concentration factor caused by a nozzle in a pressurized spherical vessel. The solution on which the program is based is obtained by an approximate method in which only bulk equilibrium and deformation requirements are maintained. The results are compared with available test data. The computer program is written for a General Electric 605 Time Sharing Computer. A complete listing of the program, including full documentation, is presented. In addition, a typical computer run is included. (Author)
AD-713 692 HC$3.00 MF$0.65

FORMAT--FORTRAN MATRIX ABSTRACTION TECHNIQUE. VOLUME V-SUPPLEMENT 1. ENGINEERING USER AND TECHNICAL REPORT--EXTENDED.
Final rept. 1 Jul 68-30 Apr 70,
Douglas Aircraft Co Long Beach Calif
J. Pickard. Aug 70, 73p Rept no. DAC-33569-Vol-5-Suppl-1 AFFDL-TR-66-207-Vol-5-Suppl-1
Contract F33615-68-C-1633
See also Volume 5, AD-683 261 and Volume 6, AD-683 262.

Descriptors: (*Structural properties, Programming (Computers)), (*Airframes, Structural properties), Matrix algebra, Stresses, Loading (Mechanics), Airplane panels, Instruction manuals.
Identifiers: FORMAT computer program.

The FORMAT System has been updated by the incorporation of additional basic capability and the refinement of existing capability. A simpler mode of updating case data and extended force method matrix generation capability has been incorporated in Phase I of the system. A refined 'Structure Cutter' module, capabilities for matrix partitioning and instruction looping, and an additional eigenvalue/eigenvector extraction module have been incorporated in Phase II. Finally the limitations which existed in the matrix plotting capability in Phase III have been eliminated. Engineering user and technical information is presented in this report. Included are recommendations of improvements in implementation and utilization procedures for various computer systems. (Author)
AD-713 727 HC$3.00 MF$0.65

WAVE PROPAGATION IN LAMINATED COMPOSITES,
Northwestern Univ Evanston Ill
George Herrman, and Jan D. Achenbach. 1970, 25p
Contract Nonr-1228 (34)
Proceedings of the Symposium on Naval Structural Mechanics (5th) held in Philadelphia, Pa. May 8-10 1967.
Availability: Pub. in Mechanics of Composite Materials, p337-360 n.d.

Descriptors: (*Mechanical waves, *Composite materials), Continuum mechanics, Laminates, Harmonic analysis, Elasticity, Strain (Mechanics), Flexural strength.
Identifiers: Fiber composites, Fiber laminates.

A discussion is presented of several dynamic theories for laminated and fiber-reinforced composites advanced recently by the authors. These theories all employ the concept of 'effective stiffnesses' and thus include a description of essential properties of dynamic behavior which the commonly used 'effective moduli' theories do not contain. The features of the newly developed theories are exhibited by the study of propagation of plane free harmonic waves in an unbounded composite solid. Dispersion curves are displayed for both transverse and longitudinal motions, and for a laminated medium, comparisons are made with curves obtained by using the equations of the theory of elasticity for all layers. (Author)
AD-713 745

FREE AND FORCED TORSIONAL MOTION OF JOINED CONCENTRIC CIRCULAR SHELLS.
Technical rept.,
Watervliet Arsenal N Y
E. J. Brunelle. Aug 70, 15p Rept no. WVT-7048
Availability: Pub. in Jnl. of Sound and Vibration, v12 n1 p113-123 1970.

Descriptors: (*Structural shells, *Torsion), Cylindrical bodies, Vibration, Boundary value problems, Spacecraft, Meteors.
Identifiers: Cylindrical shells.

The paper describes the free and forced motion of two, thin, concentric, circular cylindrical shells joined at their ends by rigid diaphragms with inertial properties. Mathematically the problem is described by two special Sturm-Liouville systems with common eigenvalues coupled only through the boundary conditions. The systems possess a modified orthogonality principle and give rise to a modified expansion principle for the associated non-homogeneous systems. These principles are derived in detail and several free motion problems are presented to illustrate the theory. (Author)
AD-713 748

A NEW METHOD OF DIRECT COMPUTATION FOR SHOCK COMPRESSION OF METALS.
Technical rept.,
Watervliet Arsenal N Y
Yun K. Huang. Aug 70, 10p Rept no. WVT-7050
Availability: Pub. in Les Proprietes Physiques des Solides sous Pression, n188 p43-47, 8-10 Sep 69.

Descriptors: (*Impact shock, Metals), (*Silver, Compressive properties), Shock waves, High-pressure research, Equations of state, Turbines.
Identifiers: Gruneisen parameters.

In the paper is presented a new method for the evaluation of high-pressure properties of metals within the validity range as imposed by shock wave measurements with U = A + Bu (here U denoting the shock wave velocity, u the particle velocity of shocked metal, and A, B the two empirical constants characterizing the U-u graph). Explicit formulas are established for calculating the Gruneisen gamma and sound velocity behind the shock front, in terms of the measurable parameter U. These new formulas not only exhibit an interplay between static and dynamic compressibilities but also provide us with an analytical tool for the assessment of shock heating in metals. It is hoped that the present scheme of computation should be so useful to high pressure researchers as the Mollier chart and gas tables to contemporary designers of turbines, jet engines, and rocket motors. (Author)
AD-713 764

NONLINEAR MATERIAL AND GEOMETRIC BEHAVIOR OF SHELL STRUCTURES.
Technical rept.,
Brown Univ Providence R I Div of Engineering
Georges A. Dupuis, Hugh D. Hibbitt, Sean F. McNamara, and Pedro V. Marcal. Sep 70, 31p
Rept no. TR-3
Contract N00014-67-A-0191-0008
Presented at the Joint Lockheed Company and Air Force Flight Dynamics Laboratory Conference on Computer Oriented Analysis of Shell Structures, Palo Alto, Calif.

Descriptors: (*Structural shells, Structural properties), Beams (Structural), Metal plates, Loading (Mechanics), Stresses, Numerical analysis, Partial differential equations.
Identifiers: Finite element analysis, Euler-Lagrange equation.

The nonlinear analysis of shell structures is studied by both the Eulerian and the Lagrangian approach. Current methods are discussed on the basis of both formulations. It is found that the widely used updated procedure is a combination of both approaches. From the current standpoint it makes use of a mixture of incremental stiffnesses derived by both approaches. The 'bowing' effect was found to be the main source of error in this updated procedure, and this effect was shown to be negligible when a large number of elements were used. Case studies investigate various aspects of the nonlinear behavior of arches, axisymmetric shells of revolution, flat plates, and arbitrary shells. (Author)
AD-713 797 HC$3.00 MF$0.65

FIELD EQUATIONS GOVERNING THE MECHANICAL BEHAVIOR OF LAYERED CIRCULAR CYLINDERS,
Northwestern Univ Evanston Ill Dept of Civil Engineering
J. D. Achenbach, and F. H. Chou. 19 Feb 70, 8p
Contract Nonr-1228 (34)
Prepared in cooperation with San Diego State College, Calif. Dept. of Civil Engineering. Presented at the AIAA Aerospace Sciences Meeting (8th), New York, N. Y., 19-21 Jan 70. (Paper 70-134). Revision of report dated 27 Aug 69.
Availability: Pub. in AIAA Jnl., v8 n8 p1445-1452 Aug 70.

Descriptors: (*Structural shells, Mechanical properties), Cylindrical bodies, Stresses, Boundary value problems, Equations of motion, Deformation, Elasticity.
Identifiers: Cylinders.

A system of equations is derived to describe the mechanical behavior of multilayered cylinders, consisting of alternating layers of a high-modulus reinforcing material and a low-modulus matrix material. The first stage of the derivation involves certain assumptions and operations within the system of discrete, curved layers. In the next stage a transition is accomplished from the system of discrete layers to a homogeneous continuum model, whereby the state of deformation in the multilayered body is described by fields defining gross displacements and local deformations. The system of governing equations includes stress equations of motion, constitutive relations, boundary conditions, and displacement equations of motion. The governing equations are similar in form to those of a theory of elasticity with microstructure. It is shown that the 'effective modulus' theory is a special limit case of the theory presented herein. (Author)
AD-713 798

FORMAT-FORTRAN MATRIX ABSTRACTION TECHNIQUE. VOLUME VII--SUPPLEMENT 1. DESCRIPTION OF DIGITAL COMPUTER PROGRAM--PHASE III--EXTENDED.
Final rept. 1 Jul 68-30 Apr 70,
Douglas Aircraft Co Long Beach Calif
J. A. Frank. Aug 70, 39p Rept no. DAC-33569-Vol-7-Suppl-1 AFFDL-TR-66-207-Vol-7-Suppl-1
Contract F33615-68-C-1633
See also Volume 7, AD-683 782.

Descriptors: (*Structural properties, Programming (Computers)), (*Airframes, Structural properties), Matrix algebra, Subroutines, Algorithms, Stresses.
Identifiers: FORMAT computer program.

The FORMAT System has been updated by the incorporation of additional basic capability and the refinement of existing capability. A simpler mode of updating case data and extended force method matrix generation capability has been incorporated in Phase I of the system. A refined 'Structure Cutter' module, capabilities for matrix partitioning and instruction looping, and an additional eigenvalue/eigenvector extraction module have been incorporated in Phase II. Finally the limitations which existed in the matrix plotting capability in Phase III have been eliminated. Programming documentation for the extended capability of Phase III of the FORMAT System is presented in this report. (Author)
AD-713 840 HC$3.00 MF$0.65

CREEP ANALYSIS OF STATICALLY INDETERMINATE BEAMS,
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
W. H. Sutherland, and V. B. Watwood, Jr. Jun 70, 61p
Contract AT (45-1)-1830

Descriptors: (*Cantilever beams, Creep properties), (*Fast reactors (Nuclear), Cooling systems), (*Reactor cores, Design), Stress analysis, Loads (Forces), Deformation, Strains, Matrices (Mathematics), Stiffness methods.
Identifiers: Finite element analysis, Flow ducts, Fast flux test facility.

For abstract, see NSA 24 20.
BNWL-1362 HC$3.00 MF$0.65

STRESS CONCENTRATIONS AROUND UNREINFORCED CIRCULAR HOLES IN A PLATE UNDER UNIDIRECTIONAL STRESS. PROJECT DRAGON,
Atomic Energy Establishment, Winfrith (England).
A. N. Kinkead. May 65, 27p

Descriptors: (*Plates (Structural members), *Stress concentration), (*High temperature gas cooled reactors, Pressure vessels), Loads (Forces), Hydrostatic stress, Strains, Great Britain.
Identifiers: Dragon project.

For abstract, see NSA 24 20.
DP-Report-344 HC$3.00 MF$0.65

DERIVATION OF TWELVE-BY-TWELVE STAFFNESS MATRIX FOR SHEAR PANEL UNDERGOING PARABOLIC DEFORMATION.
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
G. Muller. 12 Sep 69, 54p NASA-TM-X-53902, MSFC-IN-3-67

Descriptors: *Cantilever beams, *Mathematical models, *Shear strength, *Structural analysis, Deformation, Matrices (mathematics), Panels, Parabolic bodies.

For abstract, see STAR 08 21.
N70-38169 HC$3.00 MF$0.65

PRELIMINARY DESIGN PROCEDURE FOR END RINGS OF ISOTROPIC CONICAL SHELLS LOADED BY EXTERNAL PRESSURE.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
J. B. Carine, and S. C. Dixon. Sep 70, 35p NASA-TN-D-5980, L-6777
Contract 124-08-20-04

Descriptors: *Conical shells, *Engineering drawings, *Loads (forces), *Ring structures, Buckling, Isotropy, Modulus of elasticity, Physical properties, Pressure.

For abstract, see STAR 08 21.
N70-38569 HC$3.00 MF$0.65

THE CALCULATION OF ELASTIC STRESS DISTRIBUTION IN ROTATING DISKS WITH ARBITRARY TEMPERATURE DEPENDENT MATERIAL PROPERTIES.
Die Berechnung Der Elastischen Spannungsverteilung in Rotierenden Scheiben Bei Beliebig Temperaturabhaengigen Werkstoffeigenschaften
Eidgenossische Technische Hochschule, Zurich (Switzerland).
V. Beglinger. 1969, 108p DISS-4249
Lang- in German

Descriptors: *Differential equations, *Rotating disks, *Stress concentration, Modulus of elasticity, Numerical analysis, Stress analysis.

For abstract, see STAR 08 21.
N70-38583 HC$3.00 MF$0.65

SMALL DEFLECTION OF A CLASS OF CLAMPED THIN PLATES USING CONFORMAL MAPPING.
Illinois Univ., Urbana. Dept. of Theoretical and Applied Mechanics.
T. F. Moriarty, and W. J. Worley. Sep 70, 37p
NASA-CR-1657
Contract NGR-14-005-010
Coll- 37 P Refs

Descriptors: *Clamps, *Conformal mapping, *Deflection, *Thin plates, Boundary value problems, Computer programs, Flat plates, Linearity, Loads (forces).

For abstract, see STAR 08 21.
N70-38795 HC$3.00 MF$0.65

THE BEHAVIOR OF T- AND L- SHAPED PLAIN AND REINFORCED CONCRETE BEAMS LOADED IN TORSION,
West Virginia Univ., Morgantown, Dept. of Civil Engineering.
For primary bibliographic entry see Field 13M.
PB-194 988 HC$3.00 MF$0.65

BEHAVIOR OF PRESTRESSED CONCRETE RECTANGULAR MEMBERS SUBJECTED TO PURE TORSION,
West Virginia Univ., Morgantown. Dept. of Civil Engineering.
For primary bibliographic entry see Field 13M.
PB-194 989 HC$3.00 MF$0.65

THE SOUTH DAKOTA FLEXIBLE PAVEMENT RESEARCH PROJECT.
South Dakota Dept. of Highways. Physical Research Section.
For primary bibliographic entry see Field 13B.
PB-195 178 HC$3.00 MF$0.65

PAVEMENT DESIGN METHODS LITERATURE REVIEW-I,
Rensselaer Polytechnic Inst., Troy, N.Y. Winslow Labs.
For primary bibliographic entry see Field 13B.
PB-195 181 HC$3.00 MF$0.65

20L. Solid-State Physics

STUDY IN LINE AND SHAPE: CYCLOTRON RESONANCE IN InSb USING AN INFRARED LASER.
Technical memo.,
Johns Hopkins Univ Silver Spring Md Applied Physics Lab
J. R. Apel, and T. O. Poehler. Sep 70, 134p Rept no. APL-TG-1111
Contract NOw-62-0604

Descriptors: (*Semiconductors, Plasma medium), (*Indium antimonides, Cyclotron resonance phenomena), Band theory of solids, Photoconductivity, Gas lasers, Infrared detectors, Irasers, Cryogenics, Impurities, Phonons.
Identifiers: Far infrared radiation, Semiconductor plasmas, Landau levels.

An experimental and theoretical study of the shape of electron cyclotron resonance lines in n-type InSb has been made, using a far infrared gas laser as a signal source, and the quantum plasma dielectric tensor as the mathematical model describing the resonant process. The laser wavelengths ranged from 337 to 48 micrometers; the sample temperature was either 4.2 or 77 K. At liquid He temperature, an anomalous narrowing of the resonance lines is observed as the resonant magnetic field is increased, which the theory ascribes to the decreasing efficacy of ionized impurity scattering in causing Landau level transitions at high magnetic fields. Strong electron and photon interactions with the optical phonon modes are observed via greatly rebroadened lines as the magnetic field approaches 30 kG. Impurity resonant transitions are also observed having harmonics up to the fifth. At 77 K the cyclotron resonance has nearly the width expected if phonon scattering alone were at work. (Author)
AD-713 094 HC$3.00 MF$0.65

SPIN INTERACTIONS IN Cu (NO3)2.2.5H2O.
Technical rept.,
Carnegie-Mellon Univ Pittsburgh Pa Dept of Physics
J. C. Bonner, S. A. Friedberg, H. Kobayashi, and B. E. Myers. 1 Sep 70, 12p Rept no. TR-2
Contract N00014-67-A-0314-0006

Descriptors: (*Copper compounds, *Antiferromagnetism), Nitrates, Hydrates, Thermal properties, Magnetic moments, Cryogenics.
Identifiers: *Copper nitrates, Electron spin, Exchange interactions.

Cu (++) spins in Cu (N03)2.2.5H20 are antiferromagnetically coupled in pairs which experience a weaker antiferromagnetic interpair interaction. The linked pairs appear to form one-dimensional arrays. The magnetic and thermal data are quantitatively described by two models in which pairs form (1) rungs of a ladder; (2) alternate links of a chain. Unusual behavior upon adiabatic magnetization at very low T is also interpretable with these models. (Author)
AD-713 133 HC$3.00 MF$0.65

DEVELOPMENT OF TECHNIQUES FOR PREPARING HIGH-PURITY SINGLE-CRYSTAL GALLIUM PHOSPHIDE AND ALLOYS OF GALLIUM PHOSPHIDE AND INDIUM PHOSPHIDE.
Massachusetts Inst of Tech Lexington Lincoln Lab
For primary bibliographic entry see Field 20B.
AD-713 137 HC$3.00 MF$0.65

FRACTURE MECHANICS FOR DESIGN AND FAILURE ANALYSIS.
Interim technical rept.,
Syracuse Univ N Y Metallurgical Research Labs
Volker Weiss. Aug 70, 39p Rept no. MET-VW-1810-10870
Contract N00019-70-C-0044

Descriptors: (*Fracture (Mechanics), Alloys), Failure (Mechanics), Loading (Mechanics), Notch toughness, Crack propagation, Stresses, Strain (Mechanics), Yield point.

The present paper is a brief review of how fracture mechanics can be applied to design and failure analysis with particular reference to peak performance structures. After a review of the foundations of fracture mechanics, a description of the testing procedures to obtain the material characteristics, which are to be used in the material selection, the design and failure analysis is given. Finally, a number of examples representative of how this new discipline of fracture mechanics can be applied to design and failure analysis and the general areas where an extension of the new discipline appears most desirable, are outlined.
AD-713 148 HC$3.00 MF$0.65

CONSOLIDATED QUARTERLY REPORT FOR THE PERIOD OCTOBER 1, 1969 TO DECEMBER 31, 1969.
Utah Univ Salt Lake City Microwave Device and Physical Electronics Lab
For primary bibliographic entry see Field 20E.
AD-713 157 HC$3.00 MF$0.65

CONSOLIDATED QUARTERLY REPORT FOR THE PERIOD JULY 1, 1969 TO SEPTEMBER 30, 1969.
Utah Univ Salt Lake City Microwave Device and Physical Electronics Lab
For primary bibliographic entry see Field 20E.
AD-713 158 HC$3.00 MF$0.65

LUMINESCENCE STUDY OF EXCITON-EXCITON INTERACTION IN CADMIUM SULFIDE, CADMIUM SELENIDE, AND ZINC OXIDE.
Doctoral thesis,
Cornell Univ Ithaca N Y Materials Science Center
Mchael Douglas Magde. Jun 70, 140p Rept nos.
MSC-1325, MSC-TR-32
Contract Nonr-401 (47)

Descriptors: (*Semiconductors, *Luminescence), (*Cadmium sulfides, Excitons), (*Cadmium selenides, Excitons), Band theory of solids, Zinc compounds, Excitation, Phonons, Cryogenics, Lasers, Oxides, Theses.
Identifiers: *Exciton exciton interactions, *Zinc oxides, Two photon absorption.

The thesis reports the results of an experimental study of luminescence in several 2-6 semiconducting compounds at excitation levels, provided by laser pulses, of 1 Kw/sq cm to 5 Mw/sq cm. Under such conditions an additional luminescence band appears which is not observed when luminescence is excited by much lower intensity conventional mercury lamps. The additional emission was observed in two different types of CdS as well as in CdSe and ZnO. In each case it increased at a rate faster than linear, becoming prominent in the range 10 - 100 kW/sq cm whereas luminescence attributed to bound excitons increased linearly with excitation intensity at first, but eventually, in all cases except ZnO, appeared to saturate. A kinetic treatment of the model yields the following value for the cross section for this process: 10 to the 16th power/sq cm. (Author)
AD-713 181 HC$3.00 MF$0.65

RESEARCH ACTIVITIES IN THE FIELD OF MATERIALS SCIENCE.
North Carolina Univ Chapel Hill Materials Research Center
For primary bibliographic entry see Field 11G.
AD-713 198 HC$3.00 MF$0.65

FINAL REVIEW REPORT.
California Inst of Tech Pasadena
For primary bibliographic entry see Field 20I.
AD-713 228 HC$3.00 MF$0.65

MAGNETOSTRICTIVE GENERATION OF SURFACE ELASTIC WAVES,
California Univ Berkeley Dept of Electrical Engineering
For primary bibliographic entry see Field 20A.
AD-713 245

PHOTOCONDUCTIVITY AND OPTICAL PROPERTIES OF AMORPHOUS GeTe,
IBM Watson Research Center Yorktown Heights N Y
R. Tsu, W. E. Howard, and L. Esaki. 1970, 10p AROD-8511:2-P
Contract DAHC04-69-C-0069
Availability: Pub. in Jnl. of Non-Crystalline Solids, v4 p322-327 1970.

Descriptors: (*Solid solutions, *Photoconductivity), (*Semiconducting films, Band theory of solids), Resistance (Electrical), Germanium compounds, Tellurides, Cryogenics.
Identifiers: *Germanium tellurides, Amorphous semiconductors, Amorphous materials.

Unlike crystalline GeTe, amorphous GeTe has a relatively wide energy gap of 0.7 eV at 295 K, and 0.77 eV at 77K. Its resistivity is about 1000 ohm-cm at room temperature, and increases exponentially with 1/T, giving an activation energy of 0.35 eV. The crystallization temperature for the amorphous GeTe films is about 390 K. The measured absorption coefficient is used to calculate a density of states which behaves very much as one would expect on the basis of the Mott model. The photocurrent for low photon energies has a long lifetime of tens of milliseconds, however, at higher photon energies, above 1 eV, the lifetime is less that 30 nsec. At low temperatures the fast lifetime is slowed to a few microsec. Near room temperatures where the thermally generated carrier density is approximately 3 x 10 to the 16th power/cc, obtained from density of states, the dependence of the photocurrent on the light intensity is linear; below 150 K, the intensity dependence is a square root law, indicating bimolecular recombination. (Author)
AD-713 249

HEAT CAPACITY STUDIES OF INTERMETALLIC COMPOUNDS CONTAINING RARE EARTH ELEMENTS,
Pittsburgh Univ Pa Dept of Chemistry
W. E. Wallace, R. S. Craig, A. Thompson, C. Deenadas, and M. Dixon. 1969, 19p AROD-5375:5-MC
Grant DA-ARO (D)-31-124-G974
Sponsored in part by the National Aeronautics and Space Agency, Washington, D. C.
Availability: Pub. in Les Elements Des Terres Rares, v2 n180 p427-441, 5-10 May 69.

Descriptors: (*Intermetallic compounds, Specific heat), (*Rare earth elements, Intermetallic compounds), Crystal lattice defects, Molecular energy levels, Lanthanum, Cerium alloys, Praseodymium, Neodymium alloys, Gadolinium alloys, Antimony alloys, Bismuth alloys, Aluminum alloys.
Identifiers: Schottky defects, *Ligand fields.

Heat capacity results are presented for LaSb, PrSb, LaBi, PrBi, REAl2 with RE = La, Ce, Pr and Gd, RENi2 with RE = Ce, Pr and Nd and GdNi5. The temperature range covered is 7 to 300K; in a few cases measurements were made below 4K. Results for LaSb, LaBi and LaAl2 give no clear evidence for anything except vibrational and electronic contributions. PrSb, PrBi and PrNi2 exhibit Schottky-type termal anomalies which are attributed to excitation within the crystal field states. These are confirmed as Van Vleck paramagnets, with overall splittings of 280, 280 and 138K, respectively. PrAl2 exhibits a lambda-type thermal anomaly around its Curie temperature, 31 K. The magnetic heat capacity anomaly for GdAl2 extends from 4 to 180K suggesting that in this material the disordering process is weakly cooperative. NdNi2 exhibits a lambda-type thermal anomaly at 9K and a Schottky-type anomaly. The latter is regarded as a crystal field effect and an overall splitting of 431K is indicated. (Author)
AD-713 250

CONTACT-POTENTIAL CHANGES PRODUCED ON METAL SURFACES BY TENSILE STRESSES,
Virginia Univ Charlottesville Dept of Physics
For primary bibliographic entry see Field 20C.
AD-713 251

OBSERVATION OF SPIN-WAVE SPECTRUM IN AN INSTABILITY AND MODE-LOCKING EXPERIMENT,
California Univ Berkeley Electronics Research Lab
S. Wang, and Ta-Lin Hsu. 1 May 70, 6p AROD-7101:5-E
Grants DA-ARO-D-31-124-70-G12, DAHC04-70-G-0012
Revision of report dated 25 Mar 70.
Availability: Pub. in Applied Physics Letters, v16 n12 p534-536, 15 Jun 70.

Descriptors: (*Magnetic resonance, Microwave spectroscopy), Radiofrequency power, Ultrasonic radiation, Absorption spectrum.
Identifiers: *Magnons, Spectrum analysis.

Spin-wave spectrum in an instability and mode-locking experiment was observed by using a spectrum analyzer. The experiment confirms that spin-wave side bands exist. The beating of the side bands with the central band is shown to be the cause for low-frequency modulation of the reflected microwave power. When a low-frequency acoustic wave was sent into the sample, the amplitude of the side bands increased at the expense of the central band. Therefore, the effect of magnetoelastic coupling can be used not only to lock the phases of the various spin-wave modes but also to regulate their amplitudes. (Author)
AD-713 257

OPTICAL PROPERTIES AND ELECTRONIC DENSITY OF STATES,
Brown Univ Providence R I
Manuel Cardona. 10 Oct 69, 16p AROD-6412:28-P
Contract DA-31-124-ARO (D)-454
Presented at the Materials Research Symposium (3rd), Electronic Density of States, Gaithersburg, Md., 3-6 Nov 69.
Availability: Pub. in Jnl. of Research of the National Bureau of Standards A, Physics and Chemistry, v74A n2 p253-265 Mar-Apr 70 (Paper 74A2-597).

Descriptors: (*Semiconductors, *Band theory of solids), (*Dielectrics, Optical properties), Absorption spectrum, Excitons, Dielectric properties, Gallium arsenides, Antimony compounds, Germanium, Silicon, Selenium, Tin, Tellurides.
Identifiers: Density of states, Gallium antimonides, Lead tellurides, Cadmium tellurides, Mercury tellurides.

The fundamental absorption spectrum of a solid yields information about critical points in the optical density of states. This information can be used to adjust parameters of the band structure. Once the adjusted band structure is known, the optical properties and the density of states can be generated by numerical integration. This paper reviews the parametrization techniques used for obtaining band structures suitable for density of states calculations. The calculated optical constants are compared with experimental results. The energy derivative of these optical constants is discussed in connection with results of modulated reflectance measurements. It is also shown that information about density of empty states can be obtained from optical experiments involving excitation from deep core levels to the conduction band. (Author)
AD-713 264

CURRENT-INDUCED REFLECTIVITY EFFECTS IN A SEMICONDUCTOR,
Idaho Univ Moscow Dept of Physics
C. Vernon Hodge, and Carl A. Baumgardner. 21 Nov 69, 7p AROD-7985:5-P
Grant DA-ARO (D)-31-124-G1101
Revision of report dated 12 Aug 69.
Availability: Pub. in The Physical Review B, v1 n8 p3347-3350, 15 Apr 70.

Descriptors: (*Semiconductors, Optical properties), (*Indium antimonides, Absorption spectrum), Band theory of solids, Reflectivity, Electric currents.

Recently, the effect produced on the optical absorption of a semiconductor by small dc fields (about 100 V/cm), which cause current but do not alter the band structure, was calculated. This calculation is herein extended to the reflectivity by use of the Kramers-Kronig and Fresnel relations. Reflectivity changes and polarization effects are found as functions of photon energy (0-0.4 eV) in InSb at 77K. The effects for fundamental transitions are large (DELTA R/R is on the order of 0.001) whereas the effects for intervalence band transitions are small but measureable (delta R/R of approximately 0.00001). Uses of these effects are discussed. (Author)
AD-713 268

DENSITY OF STATES INFORMATION FROM LOW TEMPERATURE SPECIFIC HEAT MEASUREMENTS,
Illinois Univ Urbana
Paul A. Beck, and Helmut Claus. 10 Oct 69, 9p AROD-5103:22-MC
Grant DA-ARO (D)-31-124-G971
Presented at the Materials Research Symposium, Electronic Density of States (3rd), Gaithersburg, Md., 3-6 Nov 69.
Availability: Pub. in Jnl. of Research of the National Bureau of Standards-A. Physics and Chemistry, v74A n3 May/Jun 70.

Descriptors: (*Specific heat, N-body problem), (*Band theory of solids, Determination), Hyperfine structure, Cryogenics, Phonons, Superconductivity, Magnetic properties.
Identifiers: Density of states, Electron phonon interactions.

The calculation of one-electron density of state values from the coefficient gamma of the term of the low temperature specific heat linear in temperature is complicated by many-body effects. In particular, the electron-phonon interaction may enhance the measured gamma as much as twofold. The enhancement factor can be evaluated in the case of superconducting metals and alloys. In the presence of magnetic moments, additional complications arise. A magnetic contribution to the measured gamma was identified in the case of dilute alloys and also of concentrated alloys where parasitic antiferromagnetism is superimposed on an over-all ferromagnetic order. No method has as yet been devised to evaluate this magnetic part of gamma. The separation of the temperature-linear term of the specific heat may itself be complicated by the appearance of a specific heat anomaly due to magnetic clusters in superparamagnetic or weakly ferromagnetic alloys. (Author)
AD-713 276

OPTICAL MODULATION SPECTRA OF SELENIUM AND THEIR DEPENDENCE ON THE UNIAXIAL STRESS,
Brown Univ Providence R I Dept of Physics
T. O. Tuomi. 29 Dec 69, 15p AROD-6412:29-P
Contract DA-31-124-ARO (D)-454
Availability: Pub. in Physica status solidi, v38 p623-634 1970.

Descriptors: (*Selenium, Spectra (Visible + ultraviolet)), (*Semiconductors, Band theory of solids), Brillouin zones, Modulation, Polarization, Stresses, Cryogenics.
Identifiers: Optical spectra, Optical modulation spectra.

Wavelength- and stress-modulated reflectance and transmission spectra of selenium were measured at 77 K in the photon energy range from 1.7 to 3.7 eV. New structure was discovered, e.g. a peak at 2.0 eV in the wavelength-modulated reflectance spectrum with light polarized parallel to the (0001) direction. Unusually large linear stress coefficients of the peaks were found. (Author)
AD-713 283

TEMPERATURE AND PRESSURE DEPENDENCE OF THE OPTICAL AND ELECTRICAL GAP IN CHALCOGENIDE GLASSES,
Energy Conversion Devices Inc Troy Mich
Edward A. Fagen, H. Fritzsche, S. H. Holmberg, R. W. Seguin, and John P. de Neufville. 1970, 16p
Contract DAHC15-70-C-0187, ARPA Order-1570
Prepared in cooperation with Chicago Univ., Ill. Physics Dept. Presented at International Conference on the Physics of Semiconductors (10th), Cambridge, Mass. 17-21 Aug 70.

Descriptors: (*Semiconductors, Band theory of solids), (*Solid solutions, Electrical conductance), Optical properties, Hydrostatic pressure, Germanium compounds, Silicon compounds, Sulfides, Arsenides, Tellurides.
Identifiers: *Amorphous semiconductors, Amorphous materials.

The optical absorption edge E sub g and the conductivity sigma of two bulk chalcogenide semiconductor glasses were measured as functions of pressure and temperature. Results are discussed.
AD-713 288 HC$3.00 MF$0.65

THE EFFECT OF LOADING RATE AND TEMPERATURE ON THE FRACTURE TOUGHNESS OF HIGH STRENGTH STEELS.
Watervliet Arsenal N Y
For primary bibliographic entry see Field 11F.
AD-713 357 HC$3.00 MF$0.65

PERFORMANCE AND APPLICATIONS OF MICROWAVE PHOTON-PHONON DOUBLE-QUANTUM DETECTION IN MgO.
Interim rept.,
Air Force Cambridge Research Labs L G Hanscom Field Mass
Alan J. Budreau, and Paul H. Carr. 5 Sep 69, 19p
Rept no. AFCRL-70-0561
Availability: Pub. in Jnl. of the Physics and Chemistry of Solids, v31 p1709-1717 1970.

Descriptors: (*Magnesium oxides, *Phonons), Microwaves, Iron, Doping, Crystal structure.

Microwave phonons at 3.1, 4.7, and 9.3 GHz were generated with CdS thin-film transducers, propagated through Fe (2+)-doped MgO at 1.5K, and detected with a photon-phonon double-quantum detector. In comparing double-quantum detection with the conventional piezoelectric method, it was found that the energy detecting properties of the former yielded exponential decays even when the latter did not. The field, frequency, and angular dependencies of the double-quantum detector were measured and interpreted. A shift from the double-quantum absorption to a slowly decaying saturation signal of opposite sign was observed as the phonon frequency approached that of the photons. The better precision made possible by the exponential echo pattern of the double-quantum detector was used to obtain accurate values for phonon attenuation. The frequency dependence of attenuation in MgO at 1.5K was measured for the first time. This dependence could be fitted to a term proportional to frequency (of about 0.3 dB/cm-GHz) which indicated the presence of scattering from dislocations, and a frequency-independent term (of about 0.4 dB/cm) attributed to boundary scattering. Double-quantum detection was also used to detect the scattered phonons observed between the echoes, and to demonstrate that they represented elastically scattered phonons. (Author)
AD-713 364

ELECTROMAGNETIC WAVE-CHARGE INTERACTION IN CROSSED FIELDS.
California Univ Berkeley Electronics Research Lab
For primary bibliographic entry see Field 9A.
AD-713 399 HC$3.00 MF$0.65

STRUCTURE, PROPERTIES AND RADIATION SENSITIVITY OF ELECTRICALLY BISTABLE MATERIALS.
Semi-annual rept. no. 1,
Florida Univ Gainesville Engineering and Industrial Experiment Station
Derek B. Dove, Larry L. Hench, and Robert W. Gould. 6 Aug 70, 22p
Contract DAHC04-70-C-0024, ARPA Order-1562

Descriptors: (*Semiconducting films, Manufacturing methods), Solid solutions, Radiation damage, Crystal structure, Switching circuits, Glass, Germanium compounds, Tellurium compounds.
Identifiers: *Amorphous semiconductors, Thin films, *Ovonic switches.

The report describes work carried out during the first six-month period on a project directed towards a thorough electrical and metallurgical characterization of selected amorphous semiconducting materials. Equipment for bulk glass preparation has been set up and some thin film structures have been fabricated by flash evaporation techniques. Work has commenced on local order structural measurements and electrical characterization of binary germanium tellurium alloys. It is intended that this study will be extended into more complicated systems as the project continues. Work has commenced on systems based on the vanadium, phosphorus and potassium oxides, and a new crystalline phase has been discovered within this system. A comparative study of the electronic properties of crystalline materials and glasses having the same composition is being carried out. Finally, degradation of thin film electrodes has been observed under certain conditions and is being investigated. (Author)
AD-713 483 HC$3.00 MF$0.65

ANALYSIS AND APPLICATION OF GALLIUM ARSENIDE AVALANCHE TRANSIT TIME DEVICES,
Army Electronics Command Fort Monmouth N J Electronic Components Lab
For primary bibliographic entry see Field 9A.
AD-713 509 HC$3.00 MF$0.65

EXPLOITATION OF CONTOURED DOUBLE CANTILEVER BEAM SPECIMENS IN CRACK GROWTH AND ARREST STUDIES,
Army Materials and Mechanics Research Center Watertown Mass
Joseph I. Bluhm, Bennett E. Gordon, Jr., and Robert J. Morrissey. 1970, 14p

Descriptors: (*Crack propagation, Cantilever beams), Loading (Mechanics), Fracture (Mechanics), Toughness, Deformation, Aluminum, Graphite, Glass, Test methods.
Identifiers: Aluminum alloy 7075, Graphite AXF 5Q, Plate glass.

Although the characterization of crack stability is an important attribute of this specimen and the one which this paper treats, other desirable features are noted. Multiple toughness determinations can be obtained in a single specimen. The control of pop-in lengths and the accompanying velocity changes poses further the possibility of using this specimen for study of strain rate effects on toughness and for studying the dynamics characteristics of crack propagation.
AD-713 512 HC$3.00 MF$0.65

ECHO AMPLIFICATION IN MAGNETIC MATERIALS WITH APPLICATION TO PULSE COMPRESSION RADAR,
Army Missile Command Redstone Arsenal Ala Physical Sciences Lab

For primary bibliographic entry see Field 20C.
AD-713 518 HC$3.00 MF$0.65

THE SHOCK HUGONIOT OF SINGLE-CRYSTAL SODIUM CHLORIDE.
Memorandum rept.,
Ballistic Research Labs Aberdeen Proving Ground Md
George E. Hauver, and Angelo Melani. Aug 70, 24p Rept no. BRL-MR-2061

Descriptors: (*Sodium chloride, Shock (Mechanics)), Single crystals, Shock waves, Test methods.
Identifiers: Hugoniot properties.

Shock Hugoniot data for single-crystal sodium chloride have been obtained within the pressure range from 90 to 700 kbar. The data in the shock velocity - particle velocity plane do not clearly define the onset of the transition from face-centered-cubic (NaCl) to body-centered (CsCl structure, but show evidence of it by a displacement which is first detected between 260 and 280 kbar for the (100) orientation and between 220 and 230 kbar for the (111) orientation. Lateral relaxation measurements on (111) specimens provide evidence of the transition at 208 kbar. After the displacement which occurs near the onset of the transition, data in the shock velocity - particle velocity plane follow a linear relation up to 460 kbar, where the Hugoniot stiffens to enter a third region which extends linearly up to 700 kbar (and probably to higher pressures). It is tentatively suggested that the third region from 460 to 700 kbar represents the body-centered structure, and that the second region may be a manifestation of the experimental techniques. The data are compared with those of other investigators. (Author)
AD-713 599 HC$3.00 MF$0.65

WIDE-BAND HOT-CARRIER DIODE GATE WITH APPLICATION TO ELECTRON-HOLE PLASMAS,
Boeing Scientific Research Labs Seattle Wash
For primary bibliographic entry see Field 9E.
AD-713 602 HC$3.00 MF$0.65

MATERIAL BEHAVIOR IN HIGH SPEED IMPACT.
Summary rept. 1 Jun 69-31 May 70,
Washington State Univ Pullman Shock Dynamics Lab
J. Assay, J. C. Flinn, J. W. Forbes, R. H. Mitchell, and G. E. Duvall. Jul 70, 91p Rept no. WSU-SDL-70-03 AFOSR-70-2205TR
Contract F44620-67-C-0087, ARPA Order-985

Descriptors: (*Lithium fluorides, Impact tests), (*Dislocations, Motion), Shock waves, Mechanical properties, Test methods, Cadmium sulfides, Phase studies, Etched crystals, Quartz, Acrylic resins.

The report consists of a study of the dynamics of dislocation motion and multiplication based on elastic precursor decay in LiF. In Section 2 plans and progress are described for a direct experimental measurement of the threshold dynamic stress and time for dislocation multiplication in LiF. Section 3 contains theoretical procedures for converting the current output of quartz gauges to stress in materials which produce double shock waves because of dynamic failure or phase transitions. These procedures are used in Section 4 to interpret shock measurements on CdS-lucite mixtures. Section V contains a list of nine papers, talks and reports produced under this contract. (Author)
AD-713 624 HC$3.00 MF$0.65

CRYSTAL PROPERTIES AS INFLUENCED BY CRYSTALLOGRAPHIC IMPERFECTIONS: HIGH-ENERGY ION IMPLANTATION,
International Business Machines Corp Hopewell Junction N Y East Fishkill Lab
For primary bibliographic entry see Field 20B.
AD-713 671 HC$3.00 MF$0.65

A NEW METHOD OF DIRECT COMPUTATION FOR SHOCK COMPRESSION OF METALS.
Watervliet Arsenal N Y
For primary bibliographic entry see Field 20K.
AD-713 764

CRACK PROPAGATION GENERATED BY A HORIZONTALLY POLARIZED SHEAR WAVE,
Northwestern Univ Evanston Ill Technological Inst
J. D. Achenbach. 18 Nov 69, 16p
Contract Nonr-i228 (34)
Availability: Pub. in Jnl. of the Mechanics and Physics Solids, v18 p245-259 1970.

Descriptors: (*Crack propagation, Mathematical analysis), Mechanical waves, Wave functions, Loading (Mechanics), Shear stresses, Partial differential equations.
Identifiers: Harmonic functions.

A plane horizontally-polarized shear wave propagates into an undisturbed brittle elastic material containing a void. The paper inquires into the conditions for initiation of crack propagation at an instantaneous velocity upon diffraction of the wave by the void. The investigation consists of two parts. In the first, the particle velocity and the shear stresses are determined for diffraction of a transient wave of arbitrary shape by a wedge-shaped void which produces a running crack at the instant the wave front strikes the tip of the wedge. In the second, the balance of rate-of-energy is employed to determine that shape of the incident pulse which is consistent with crack propagation at an instantaneous velocity. It is shown that near the wave front the incident displacement wave must be of the form of a square root of the general argument t-ax-by. For this particular type of incident wave, the instantaneous velocity of crack propagation is computed as a function of the angle of incidence, the 'amplitude' of the incident wave, and of the material parameters. (Author)
AD-713 826

NAVAL RESEARCH REVIEWS, VOLUME XXIII, NUMBER 9,
Office of Naval Research Arlington Va
For primary bibliographic entry see Field 20M.
AD-713 838

THE QUAD SCHEME: A NEW METHOD FOR PHASE SPACE INTEGRATION,
Argonne National Lab., Ill.
F. M. Mueller, J. W. Garland, M. H. Cohen, and K. H. Bennemann. Mar 69, 43p
Contract W-31-109-eng-38

Descriptors: (*Transition metals, *Band structure of solids), (*Measure and integration, Computer programs), Face centered cubic lattices, Brillouin zones, FORTRAN.
Identifiers: QUAD computer program.

For abstract, see NSA 24 20.
ANL-7556 HC$3.00 MF$0.65

STARK EFFECT OF THE M AND N CENTERS IN KCl, Na Cl, AND LiF,
Wisconsin Univ., Madison. Dept. of Physics.
L. A. DeWerd. 1968, 18p
Contract AT (11-1)-1105

Descriptors: (*Color centers, *Stark effect), Lithium fluorides, Sodium chloride, Potassium chloride.

For abstract, see NSA 24 20.
COO-1105-158 HC$3.00 MF$0.65

LOW TEMPERATURE ANNEALING OF ELECTRON IRRADIATED GERMANIUM.
Illinois Univ., Urbana.
For primary bibliographic entry see Field 11F.
For abstract, see NSA 24 20.
COO-1198-735 HC$3.00 MF$0.65

FINAL REPORT ON DYNAMIC ASPECTS OF CONCENTRATED MAGNETIC SYSTEMS,
Kansas Univ., Lawrence. Dept. of Physics.
Peter M. Richards. Jun 70, 12p
Contract AT (11-1)-1488

Descriptors: (*Magnetic resonance, Technical reports), (*Yttrium iron garnets, *Magnons), Paramagnetic resonance, Nuclear magnetic resonance, Harmonic generators.

For abstract, see NSA 24 20.
COO-1488-21 HC$3.00 MF$0.65

STRUCTURE AND PROPERTIES OF SOLID SOLUTIONS.
Michigan Technological Univ., Houghton. Dept. of Metallurgical Engineering.
For primary bibliographic entry see Field 11F.
For abstract, see NSA 24 20.
COO-916-17 HC$3.00 MF$0.65

MEASUREMENTS OF PREFERRED ORIENTATION IN BERYLLIUM FOILS.
EG and G, Inc., Las Vegas, Nev.
For primary bibliographic entry see Field 20B.
For abstract, see NSA 24 20.
EGG-1183-1476 HC$3.00 MF$0.65

ON THE THERMOLUMINESCENCE OF AMORPHIC AND CRYSTALLINE GERMANIUM DIOXIDE.
Zur Thermolumineszenz des Amorphen Und Kristallinen Geo2
Eidgenossische Technische Hochschule, Zurich (Switzerland).
H. Boehm. 1969, 82p DISS-4281
Lang- in German Spon- Supported in Part By Owens-ill., Inc., Toledo

Descriptors: *Band structure of solids, *Electron recombination, *Germanium oxides, *Thermoluminescence, Crystallography, Dynamic models, Temperature effects.

For abstract, see STAR 08 21.
N70-38581 HC$3.00 MF$0.65

BIBLIOGRAPHY OF MAGNETIC MATERIALS AND TABULATION OF MAGNETIC TRANSITION TEMPERATURES,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 20C.
For abstract, see NSA 24 20.
ORNL-RMIC-7 (Rev.2) HC$3.00 MF$0.65

STRUCTURAL ANALYSIS OF SHIPPING CASKS. VOL. 8. EXPERIMENTAL STUDY OF THE STRESS-STRAIN PROPERTIES OF LEAD UNDER SPECIFIED IMPACT CONDITIONS.
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 18F.
For abstract, see NSA 24 20.
ORNL-TM-1312 (Vol.8) HC$3.00 MF$0.65

METHODS OF MEASUREMENT FOR SEMICONDUCTOR MATERIALS, PROCESS CONTROL, AND DEVICES.
Quarterly rept. 1 Jan-31 Mar 70,
National Bureau of Standards, Washington, D.C.
W. Murray Bullis, and A. J. Baroody, Jr. Sep 70, 68p NBS-TN-555
Sponsored in part by Defense Atomic Support Agency, Navy Strategic Systems Project Office, Navy Electronic Systems Command, and National Aeronautics and Space Administration. Paper copy also available from Superintendent of Documents, GPO, Washington, D.C. 20402. $0.65 as C13.46:555.

Descriptors: (*Semiconductors (Materials), Electrical properties), (*Semiconductor devices, Quality control), Electrical resistance, Thermodynamic properties, Microwave equipment, Electric ter-

minals, Process control, Bonding, Silicon, Germanium, Gamma counters, Reliability (Electronics), Integrated circuits.
Identifiers: Carrier lifetime.

The report describes NBS activities directed toward the development of methods of measurement for semiconductor materials, process control, and devices. Principal emphasis is placed on measurement of resistivity, carrier lifetime, and electrical inhomogeneities in semiconductor crystals; evaluation of wire bonds, metallization adhesion, and die attachment; and measurement of thermal properties of semiconductor devices and electrical properties of microwave devices. Work on related projects on silicon nuclear radiation detectors and specification of germanium for gamma-ray detectors is also described. Supplementary data concerning staff, standards committee activities, technical services, and publications are included as appendixes. (Author)
PB-194 961 HC$0.65 MF$0.65

RESPONSE IN A TRANSVERSELY ISOTROPIC ROD TO A TRANSIENT INPUT,
California Univ., Berkeley. Structural Engineering Lab.
H. D. McNiven, and Y. Mengi. Aug 70, 21p
UCSESM-70-16
Grant NSF-GK10070

Descriptors: (*Elastic theory, Rods), Stress analysis, Strains, Airy function, Transient response, Laplace transformation.

In this study the response in a transversely isotropic, semi-infinite elastic rod is found to an input on its end that is time dependent. The solution follows closely the method developed by Skalak for isotropic rods which uses integral transforms to solve the governing equations. The solution differs from that of Skalak, apart from material properties, in that in this study mixed-mixed conditions are assumed for the end of the rod. The responses are found at a 'distant' station and are expressed in terms of the axial and tangential strains. (Author)
PB-195 087 HC$3.00 MF$0.65

TECHNIQUES FOR MEASURING STRESS, STRAIN, AND RESISTIVITY AT 4 K FOR VERY SOFT MATERIALS,
National Bureau of Standards, Boulder, Colo. Cryogenics Div.
For primary bibliographic entry see Field 14B.
PB-195 253

RADIATION GENERATED WAVE PROPAGATION IN ELASTIC NONCONDUCTORS,
Sandia Labs., Albuquerque, N.Mex.
Jace W. Nunziato. Jun 70, 23p

Descriptors: (*Stress waves, Thermoelastic theory), (*Laser beams, Interactions), Thermal stresses, Numerical analysis, Boundary value problems.
Identifiers: WONDY 3 computer program.

For abstract, see NSA 24 20.
SC-RR-70-428 HC$3.00 MF$0.65

STUDY OF DIFFUSION OF MANGANESE IN RELATION TO IMPURITIES IN TERNARY ALLOYS OF Ni-Mn- THIRD ELEMENT (Issledovanie Diffuzii Margantsa v Zavisimosti ot Primesei v Troinykh Splavakh Nikel-Marganets-Tretii Element),
National Science Foundation, Washington, D.C.
Special Foreign Currency Science Information Program.
For primary bibliographic entry see Field 11F.
TT-70-57059 HC$3.00 MF$0.65

DETERMINATION OF STRESSED AND DEFORMED STATES IN LIGHT METALS UNDER NEUTRON IRRADIATION (Ob Opredelenii Napryazhennogo i Deformirovannogo Sostoyaniya v Legkikh Metallakh pri Obluchenii Neitronami),
National Science Foundation, Washington, D.C.
Special Foreign Currency Science Information Program.
A. G. Zhuravlev. 1970, 13p SFCSI-Comm (TT-70-57064), DMDC-4016
Trans. of Moscow Univ. Vestnik. Seriya 1: Matematika, Mekhanika (USSR) v16 p54-58 1961.

Descriptors: (*Metals, *Neturon irradiation), (*Crystal defects, *Radiation damage), Elastic properties, Stresses, Deformation, Translations, USSR.

Irradiation of a substance by a beam of neutrons gives rise to a number of complicated structural changes and transformations, of which some are primary changes and the remaining, secondary. Interaction between high-energy radiation and the substance is a cascade process consisting of the appearance of primary effects, their further development and propagation. In the case of neutron irradiation, the primary effects include the dispacement of atoms from lattice corners, excitement of atoms and electrons not leading to their displacement and nuclear transformadons. Ionization in this case is the secondary effect. (Author)
TT-70-57064 HC$3.00 MF$0.65

STUDY OF KINETICS OF CHANGE IN PROPERTIES OF METALS AND ALLOYS ON HEATING BY THE METHOD OF ELASTIC VIBRATIONS (Izuchenie Metodom Uprugikh Kolebanii Kinetiki Izmeneniya Svoistv Metallov i Splavov pri Nagreve),
National Science Foundation, Washington, D.C.
Special Foreign Currency Science Information Program.
For primary bibliographic entry see Field 11F.
TT-70-57076 HC$3.00 MF$0.65

ACHIEVEMENTS AND PROSPECTS OF INVESTIGATIONS ON PROBLEMS OF DIFFUSION OF SUBSTANCES IN SOLID STATE (Dostizheniya i Perspektivy Issledovateskoi Raboty nad Problemarmi Diffuzii Veshchestva v Tverdykh Telakh),
National Science Foundation, Washington, D.C.
Special Foreign Currency Science Information Program.
V. I. Arkharov. 1970, 68p SFCSI-Comm (TT-70-57079), DMDC-5404
Trans. of Akademiya Nauk SSSR. Uralskii Filial, Sverdlovsk. Institut Fiziki Metallov. Trudy, n12 p94-120 1949.

Descriptors: (*Solid state physics, Diffusion), (*Diffusion, *Metals), Reviews, Diffusion coefficient, Grain boundaries, Kinetics, Translations, USSR.

A review is presented of early Soviet work on diffusion in solids. The emphasis is on the more practical aspects of diffusion. Most references are of east european rather than western origin. Subject coverage, as well as materials reviewed, is broad in scope. (Author)
TT-70-57079 HC$3.00 MF$0.65

EFFECT OF SMALL AMOUNTS OF IMPURITIES (ANTIMONY AND BERYLLIUM) ON THE RATE OF DIFFUSION OF ZINC IN POLYCRYSTALLINE BRASS (O Vliyanii Malykh Primesei Surmy i Berilliya na Skorost Diffuzii Tsinka v Polikristallicheskoi Latuni),
National Science Foundation, Washington, D.C.
Special Foreign Currency Science Information Program.
For primary bibliographic entry see Field 11F.
TT-70-57080 HC$3.00 MF$0.65

EIGHTH PROGRESS REPORT ON SOLID-STATE AND MOLECULAR PHYSICS.
California Univ., Los Angeles.
For primary bibliographic entry see Field 7D.
For abstract, see NSA 24 20.
UCLA-34-P-88-30 HC$3.00 MF$0.65

HIGH VOLTAGE MICROSCOPY OBSERVATIONS OF DISLOCATIONS IN COBALT FERRITES,
California Univ., Berkeley. Lawrence Radiation Lab.
L. C. DeJonghe, and W. L. Bell. Mar 70, 6p
Contract W-7405-eng-48

Descriptors: (*Ferrites, *Dislocations (Materials)), Electron microscopy, Phase transformations.
Identifiers: *Cobalt ferrates.

For abstract, see NSA 24 20.
UCRL-19198 HC$3.00 MF$0.65

20M. Thermodynamics

POSITIVE SOLUTIONS OF NONLINEAR ELLIPTIC EIGENVALUE PROBLEMS,
California Inst of Tech Pasadena
For primary bibliographic entry see Field 12A.
AD-713 227

DENSITY OF STATES INFORMATION FROM LOW TEMPERATURE SPECIFIC HEAT MEASUREMENTS,
Illinois Univ Urbana
For primary bibliographic entry see Field 20L.
AD-713 276

EXPERIMENTAL STUDY OF THE LAMBDA TRANSITION OF LIQUID HELIUM USING FIRST SOUND ATTENUATION.
California Univ Los Angeles Dept of Physics
For primary bibliographic entry see Field 7D.
AD-713 478 HC$3.00 MF$0.65

ELECTRICAL DIGITAL-ANALOG MODEL EM-10 FOR SOLVING PROBLEMS OF NONSTATIONARY THERMAL CONDUCTIVITY,
Foreign Technology Div Wright-Patterson AFB Ohio
For primary bibliographic entry see Field 9B.
AD-713 669 HC$3.00 MF$0.65

NAVAL RESEARCH REVIEWS, VOLUME XXIII, NUMBER 9,
Office of Naval Research Arlington Va
D. W. Padgett, William M. Fairbank, H. A. Schweitman, M. A. Garstens, and Siegfried Streufert. Sep 70, 32p
See also report dated 1969, AD-690 774.
Availability: Pub. in Naval Research Review, v22 n9 p1-29 Sep 70. Paper copy available from Superintendent of Documents, GPO, Washington, D. C. 20402. $0.20. No copies furnished by DDC or NTIS.

Descriptors: (*Naval research, *Reviews), Cryogenics, Superconductors, Management planning, Military requirements, Decision making, Semiconductors, Magnetic fields.

Contents: Superconducting technology; Complex military decision making; Magnetic semiconductors; On the Naval research reserve; and Research notes.
AD-713 838

THE APPARENT TEMPERATURE AND EMISSIVITY OF NATURAL SURFACES AT MICROWAVE FREQUENCIES.
Technical rept.,
Kansas Univ., Lawrence. Center for Research.
Fawwaz T. Ulaby, Adrian K. Fung, and Shih-Tseng Wu. Mar 70, 36p CRES-TR-133-12

Contract DAAK02-68-C-0089
Distribution Limitation now Removed.

Descriptors: (*Surface temperatures, Measurement), (*Thermal radiation, Microwave frequency), Polarization, Ocean surveillance, Surface roughness, Radiometers, Atmosphere, Extraterrestrial topography, Emissivity.
Identifiers: *Remote sensing.

The effect of surface roughness on the emissivity of natural surfaces has attained considerable importance in the fields of passive microwave remote sensing of environment and planetary surface emissions. Between the plane surface model and the Lambert surface model, which describe the two extreme cases of a perfectly flat surface and a very rough surface respectively, two statistical surface models have recently been considered; the geometric optics type surface and the physical optics type surface. The paper examines the behavior of the microwave emissivity of some natural surfaces as a function of nadir angle and polarization. This examination includes a comparison between measured and calculated values of the apparent temperature of the ocean surface at 19.4 and 37 GHZ. (Author)
AD-872 878 HC$3.00 MF$0.65

COOLANT FLOW EFFECTS ON THE PERFORMANCE OF A CONICAL PLUG NOZZLE AT MACH NUMBERS FROM 0 TO 2.3.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
For primary bibliographic entry see Field 21H.
For abstract, see STAR 08 21.
N70-38751 HC$3.00 MF$0.65

CALCULATION PROCEDURE FOR HEAT TRANSFER TO A GAS-SOLID SUSPENSION FROM AN EXTERNALLY HEATED TUBE.
Information circular,
Bureau of Mines, Washington, D.C.
M. B. Bransford, and J. H. Holden. Aug 70, 33p
IC-8474

Descriptors: (*Heat transfer, Dispersions), (*Coal, Heat transfer), Gases, Tubes, Velocity, Computation, Two phase flow.

A calculation procedure was evolved for determining the heat-transfer characteristics of dilute gas-solid mixtures in an externally heated tube. The procedure accounts for differences in gas and particle velocities and covers a range of particle sizes. Heat transfer coefficients obtained by the calculation procedure are compared with values reported in the literature. (Author)
PB-194 938 HC$3.00 MF$0.65

DESIGN AND CONSTRUCTION OF A RADIATION PROBE.
Rept. of investigations ,
Bureau of Mines, Washington, D.C.
C. H. Schwartz, and A. A. Orning. Sep 70, 24p*
RI-7427

Descriptors: (*Furnaces, Thermal radiation), (*Heat flux, Probes), (*Thermal measuring instruments, Design), Heat transfer, Flames, Reflection, Rotation, Blackbody radiation, Detectors, Cooling, Measurement, Calibrating.
Identifiers: *Thermal radiation probes.

A thermal radiation probe was constructed and tested in pulverized-coal-fired furnaces. A rotatable sensing head on the side of a water-cooled probe permitted measurement of radiant flux within a 7.2 degree cone from any desired direction to a point within a furnace. A response curve for a corner-fired furnace showed radiant flux of 130,000 Btu per sq ft per hr, when viewing flame, and 60,000 Btu per sq ft per hr, when sensing wall reflection. Detailed drawings and fabrication procedure are given. (Author)
PB-194 945 HC$3.00 MF$0.65

20N. Wave Propagation

A RADIO-METEOROLOGICAL INVESTIGATION OF FADING AT 2 GHz IN THE MEKONG DELTA.
Institute for Telecommunication Sciences Boulder Colo
For primary bibliographic entry see Field 17B.
AD-713 128 HC$3.00 MF$0.65

COMPUTER PROGRAMS FOR RADIATION AND SCATTERING BY ARBITRARY CONFIGURATIONS OF BENT WIRES,
Syracuse Univ N Y Dept of Electrical Engineering
Hu H. Chao, and Bradley J. Strait. 15 Sep 70, 101p
Rept no. Scientific-7 AFCRL-70-0374
Contract F19628-68-C-0180

Descriptors: (*Electromagnetic waves, Scattering), (*Antenna configurations, Mathematical analysis), Integral equations, Differential equations, Operators (Mathematics), Matrix algebra, Boundary value problems, Computer programs, Wave functions, Numerical analysis.
Identifiers: Electromagnetic radiation, FORTRAN 4 programming language, FORTRAN.

The problem of electromagnetic radiation and scattering from thin wires with arbitrary shape and with arbitrary excitation and loading is considered. This is treated as a boundary value problem which is formulated as an operator equation. Matrix methods along with the method of moments are used to solve the operator equation approximately. Computer programs suitable for handling radiation problems and plane-wave scattering problems are presented and described. For the former, current distributions, field patterns, and input impedances at the driving points are determined. For the latter, current distributions and bistatic radar cross section patterns are found. Examples are given to illustrate several applications of the programs. Numerical results are compared with experimental data and with results computed by other theoretical methods. (Author)
AD-713 156 HC$3.00 MF$0.65

A FORTRAN PROGRAM FOR WAVEGUIDE PROPAGATION WHICH ALLOWS FOR BOTH VERTICAL AND HORIZONTAL DIPOLE EXCITATION.
Interim rept.,
Naval Electronics Lab Center San Diego Calif
Richard A. Pappert, Linda R. Shockey, and William F. Moler. 15 Jun 70, 77p Rept no. NELC-IR-702

Descriptors: (*Ionospheric propagation, *Computer programs), Waveguides, Dipole moments, Electric fields, Very low frequency.
Identifiers: FORTRAN, FORTRAN 63 programming language.

The report presents an updated version of an earlier waveguide program written in the FORTRAN compiler language. The new program includes the following additions: (1) Provision for calculating excitation factors for all electric field components Ex, Ey, and Ez as a function of height within the guide. (2) The excitation factors can be generated for both vertical and horizontal electric dipole exciters. (Author)
AD-713 168 HC$3.00 MF$0.65

SCATTERING BY A PERIODIC SURFACE,
Michigan Univ Ann Arbor Radiation Lab
Tommy C. Tong, and Thomas B. A. Senior. Sep 70, 98p Rept nos. 1363-6-T, Scientific 7 AFCRL-70-0507
Contract F19628-68-C-0071

Descriptors: (*Electromagnetic waves, Scattering), (*Electric currents, Surfaces), Surface properties, Diffraction, Computer programs, Integral equations.
Identifiers: Periodic surfaces, Numerical integration.

Numerical procedures are developed for the digital solution of the integral equations for the currents induced in a perfectly conducting, two dimensional periodic surface when a plane electromagnetic wave is incident. Data are obtained for the surface and far fields for a variety of sinusoidal surfaces for plane waves of either polarization at oblique as well as normal incidence, and the results are compared with the predictions of physical optics. (Author)
AD-713 183 HC$3.00 MF$0.65

IONOSPHERIC DATA REPORT - MAY 1970.
Military Research and Development Center Bangkok (Thailand)

May 70, 38p Rept no. MRDC-70-005
See also report dated Apr 70, AD-874 354.

Descriptors: (*Radio signals, Ionospheric propagation), (*Atmospheric sounding, Thailand), Pattern recognition, Data, Reflection, Networks, Tables.
Identifiers: E1 region, F1 region, F2 region, Vertical incident sounders.

Ionospheric observations are being carried out at the Operations Room, Vertical-Incident Sounder Site, located at the Applied Scientific Research Corporation of Thailand, Bangkok, Thailand. Data are being taken with a modified model C-2 Vertical-Incident Sounder. This information is supplied to the Environmental Science Services Administration at Boulder, Colorado, U.S.A., for inclusion in the data base which supports their production of the World Wide Radio Propagation Charts. (Author)
AD-713 247 HC$3.00 MF$0.65

THE HIGH-LATITUDE F-REGION IRREGULARITY STRUCTURE DURING THE OCTOBER 30-NOVEMBER 4, 1968, MAGNETIC STORM.
Air Force Cambridge Research Labs L G Hanscom Field Mass
For primary bibliographic entry see Field 4A.
AD-713 363

METHODS OF REDUCING THE HAZARDS OF RADIO FREQUENCY ENERGY TO MILITARY ELECTRIC BLASTING DEVICES.
Army Command and General Staff Coll Fort Leavenworth Kans
For primary bibliographic entry see Field 19A.
AD-713 413 HC$3.00 MF$0.65

STUDY OF FREQUENCY-SCANNING ARRAY OF RADIATORS ON CONVEX CURVE,
Army Foreign Science and Technology Center Washington D C
For primary bibliographic entry see Field 9E.
AD-713 471 HC$3.00 MF$0.65

IONOSPHERIC DATA REPORT - JUNE 1970.
Military Research and Development Center Bangkok (Thailand)

Jun 70, 38p Rept no. MRDC-70-006
See also AD-710 432.

Descriptors: (*Radio signals, *Ionospheric propagation), (*Atmospheric sounding, Thailand), Pattern recognition, Reflection, Networks, Tables.
Identifiers: E 1 region, F 1 region, F 2 region, Vertical incident sounders.

Ionospheric observations are being carried out at the Operations Room, Vertical-Incident Sounder

Site, located at the Applied Scientific Research Corporation of Thailand, Bangkok, Thailand. Data are being taken with a modified model C-2 Vertical-Incident Sounder. This information is supplied to the Environmental Science Services Administration at Boulder, Colorado, U.S.A., for inclusion in the data base which supports their production of the World Wide Radio Propagation Charts. (Author)
AD-713 490 HC$3.00 MF$0.65

SIMULATION OF HIGH ALTITUDE IONIZED AIR WITH AN ARTIFICIAL DIELECTRIC,
Army Mobility Equipment Research and Development Center Fort Belvoir Va Electromagnetic Effects Lab
William Gray, and George Merkel. 1970, 15p

Descriptors: (*Nuclear explosions, *Electromagnetic pulses), (*Atmosphere, Ionization), (*Guided missile countermeasures, Simulation), Dielectrics, Electromagnetic properties, Electromagnetic fields, Gamma rays, Partial differential equations, Antimissile defense systems.

A number of nuclear electromagnetic pulse simulators have been constructed to simulate various nuclear electromagnetic pulse environments. These simulators yield a variety of pulse magnitudes, pulse shapes, polarizations, angles of arrival, etc. Present techniques for the simulation of the interaction between an in flight missile and a nuclear electromagnetic pulse do not include the effect of ionized air that can be produced by the Compton-recoil electrons arising from the interaction of gamma-rays with the atmosphere. The paper describes a relatively modest program at the Electromagnetic Effects Laboratory at MERDC in which one is investigating the possibility of developing simulation methods that include some of the effects of the presence of an ionized air plasma when a nuclear EMP interacts with a missile or satellite. (Author)
AD-713 531 HC$3.00 MF$0.65

A MATHEMATICAL ANALYSIS OF THE PROPAGATION AND REFLECTION OF PLANE ELECTROMAGNETIC WAVES IN A NON-HOMOGENEOUS ISOTROPIC MEDIUM,
Army Engineer Topographic Labs Fort Belvoir Va
Richard A. Hevenor. 1970, 13p

Descriptors: (*Electromagnetic wave reflections, *Terrain intelligence), Wave transmission, Propagation, Refraction, Wave functions, Vector analysis, Soil mechanics, Radar signals.
Identifiers: *Remote sensing.

Considerable work has been accomplished in the area of analyzing the reflection and refraction of plane electromagnetic waves at a plane surface boundary, where the electrical parameters of the mediums under investigation are constants. In the area of Military Geographic Intelligence there exists a need to determine terrain surface and subsurface phenomena by the use of remote sensors. There is also a need to understand the consequence of nonhomogeneous soil mediums on the return energy going to a remote sensor such as a side looking airborne radar system. These needs can be fulfilled efficiently only when an understanding of the propagation and reflection of electromagnetic waves from natural terrain surfaces has been achieved. The understanding can be aided by solving the vector wave equation for the case where the soil conductivity and dielectric constant are functions of soil depth. (Author)
AD-713 539 HC$3.00 MF$0.65

FIELD STRENGTH MEASUREMENTS FOR NWC, NORTH WEST CAPE, AUSTRALIA, FROM SEPTEMBER TO DECEMBER 1967.
Final rept.,
Naval Research Lab Washington D C
C. B. Brookes, and J. E. Raudenbush. 23 Sep 70, 135p Rept no. NRL-7148

Descriptors: (*Electromagnetic waves, Very low frequency), Signal-to-noise ratio, Measurement, Diurnal variations, Transmitter-receivers, Probability, Curve fitting, Graphics, Australia, Data processing systems.

In the period from September to December 1967, the newest of the very-low-frequency (VLF) transmitting stations operated by the Navy, NWC, at North West Cape, Australia, had scheduled transmissions on six different frequencies in the VLF band. In order to obtain information on propagation paths not previously investigated, the Naval Research Laboratory installed instrumentation to collect data at selected sites in Japan, Madagascar, and Bahrain Island. Transmissions were recorded continuously for a three-month period. Examination of the data allows determination of the optimum frequency for each path investigated. (Author)
AD-713 596 HC$3.00 MF$0.65

SCATTERING BY IMPERFECTLY CONDUCTING SPHERES,
Harvard Univ Cambridge Mass Cruft Lab
Ronald W. P. King, and Charles W. Harrison, Jr. Aug 70, 40p Rept no. Scientific-9 AFCRL-70-0483 Contract F19628-68-C-0030

Descriptors: (*Plasma medium, Electromagnetic waves), (*Electromagnetic waves, Scattering), Dielectrics, Backscattering, Electric fields, Partial differential equations, Bessel functions, Graphics.
Identifiers: Scattering cross sections, Forward scattering.

The theory of scattering by an imperfectly conducting, dielectric or plasma sphere is reviewed briefly. Numerical values of the back scattering and forward scattering cross sections of spheres are given over wide ranges of the radius, the conductivity, and the permittivity including both positive and negative values. The angle of the electric field in the forward and backward directions is also represented. (Author)
AD-713 678 HC$3.00 MF$0.65

NUMERICAL SOLUTION OF WAVEGUIDE SCATTERING PROBLEMS BY FINITE-DIFFERENCE GREEN'S FUNCTIONS,
Massachusetts Inst of Tech Cambridge Research Lab of Electronics
Jerome I. Glaser. 12 Mar 70, 8p
Contract DA-28-043-AMC-02536(E), Grant NSF-GK-3370
Availability: Pub. in IEEE Transactions on Microwave Theory and Techniques, vMTT-18 n8 p436-443 Aug 70.

Descriptors: (*Electromagnetic wave reflections, *Waveguides), (*Boundary value problems, Integration), Numerical analysis, Difference equations, Green's function, S-matrix, Scattering.
Identifiers: Finite difference theory, Numerical integration.

A finite-difference Green's function method for solving time-harmonic waveguide scattering problems involving metallic obstacles of finite size by computer is described. The method is applied to the two-dimensional problem of a TE sub (10) mode impinging on cylindrical metallic posts of arbitrary shape in a rectangular waveguide. The equivalent susceptance of a transverse semidiaphragm computed using a 50 point approximation for the induced current distribution is found to be 1.5 percent less than the exact value. The S matrix of a thin bent window versus wavelength is also presented. (Author)
AD-713 749

THEORY OF GROUND-WAVE PROPAGATION ACROSS A ROUGH SEA AT DEKAMETER WAVELENGTHS.
Research rept.,
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
Donald E. Barrick. Jan 70, 140p
Contract DAAH01-70-C-0312, ARPA Order-1178 Distribution Limitation now Removed.

Descriptors: (*Radio waves, Propagation), (*Radio transmission, Theory), Radio fields, Information theory, Ocean waves, Surface roughness, Sea water, Electrical impedance, Wind, Electrical conductance, Attenuation, Reflection, Polarization, Optics, Very high frequency, High frequency.
Identifiers: Ground wave propagation, Surface radio waves.

The effect of sea state on ground-wave propagation across the ocean is computed in the HF and VHF region. The history and present understanding of ground-wave propagation is briefly reviewed, especially as concerns the influence of roughness. The approach of the analysis is to derive an effective surface impedance at grazing which includes the effects of roughness. To do this, the statistical boundary perturbation approach of rice is applied to the sea surface, which is 'slightly rough' at HF/VHF. In addition, the Leontovich (or impedance) boundary condition is employed because ocean water is a good (but not perfect) conductor at these frequencies. The analysis shows that the total effective impedance at the surface can be expressed as two terms: (1) the impedance of a perfectly smooth sea water surface at grazing, and (2) a second term accounting for roughness. (Author)
AD-865 840 HC$3.00 MF$0.65

EARLY RADIO FLASH FROM A LOW-ALTITUDE AIR BURST,
Los Alamos Scientific Lab., N.Mex.
For primary bibliographic entry see Field 18C.
For abstract, see NSA 24 20.
LA-4245 HC$3.00 MF$0.65

DETERMINATION OF THE GROUP VELOCITY DELAY OF A VHF SIGNAL PENETRATING THE IONOSPHERE BY MEASURING THE FARADAY ROTATION USING SIGNALS OF THE ATS-3 SATELLITE.
Bestimmung Der Gruppenlaufzeitverzoegerung Eines Vhf-signales in Der Ionosphaere Aus Messungen Der Faraday-rotation Mit Signalen des Satelliten Ats-3
Max-planck-institut Fur Aeronomie, Lindau Uber Northeim (West Germany). Abteilung Fuer Weltraumphysik.
W. Dieminger, K. Oberlaender, and G. Schmidt. Apr 70, 32p BMBW-FB-W-70-24
Lang- in German, English Summary Spon- Sponsored By Bundesmin. Fuer Bildung Und Wiss.

Descriptors: *Ats 3, *Faraday effect, *Group velocity, *Ionospheric propagation, *Very high frequencies, Critical frequencies, Delay, Diurnal variations, F 2 region, Phase shift, Polarized electromagnetic radiation.

For abstract, see STAR 08 21.
N70-38482 HC$3.00 MF$0.65

QUARTERLY RADIO NOISE DATA JUNE, JULY, AUGUST 1962.
Technical note,
National Bureau of Standards, Boulder, Colo.
W. Q. Crichlow, R. T. Disney, and M. A. Jenkins. 1 Mar 63, 80p NBS-TN-18-15

Descriptors: (*Natural radiofrequency interference, Data), Charts, Power measurement, Electrical measurement.

Radio noise measurements are being made at sixteen stations in a world-wide network supervised by the National Bureau of Standards (see map). The results of these measurements for the period June, July, August 1962 are presented in the attached tables. These are based on three parameters of the noise: (1) the mean power, (2) the mean envelope voltage, and (3) the mean logarithm of the envelope voltage. (Author)
PB-195 215 HC$3.00 MF$0.65

QUARTERLY RADIO NOISE DATA SEPTEMBER, OCTOBER, NOVEMBER 1962.
Technical note,
National Bureau of Standards, Boulder, Colo.
W. Q. Crichlow, R. T. Disney, and M. A. Jenkins.
10 Jun 63, 124p NBS-TN-18-16

Descriptors: (*Natural radiofrequency interference, Data), Charts, Power measurement, Electrical measuremeat.

Radio noise measurements are being made at sixteen stations in a world-wide network supervised by the National Bureau of Standards (see map). The results of these measurements for the period September, October, November 1962 are presented in the attached tables. These are based on three parameters of the noise: (1) the mean power, (2) the mean envelope voltage, and (3) the mean logarithm of the envelope voltage. (Author)
PB-195 216 HC$3.00 MF$0.65

QUARTERLY RADIO NOISE DATA DECEMBER, 1962; JANUARY, FEBRUARY, 1963.
Technical note,
National Bureau of Standards, Boulder, Colo. Central Radio Propagation Lab.
W. Q. Crichlow, R. T. Disney, and M. A. Jenkins.
21 May 64, 100p NBS-TN-18-17

Descriptors: (*Natural radiofrequency interference, Data), Charts, Power measurement, Electrical measurement.

Radio noise measurements are being made at eighteen stations in a world-wide network operated in a co-operative program co-ordinated by the National Bureau of Standards. The results of these measurements for the months December, January, and February are given in this report. The tabulated values are based on three basic parameters of the noise; these are the mean power, the mean envelope voltage and the mean logarithm of the envelope voltage. (Author)
PB-195 217 HC$3.00 MF$0.65

QUARTERLY RADIO NOISE DATA JUNE, JULY, AUGUST, 1963.
Technical note,
National Bureau of Standards, Boulder, Colo. Central Radio Propagation Lab.
W. Q. Crichlow, R. T. Disney, and M. A. Jenkins.
21 Aug 64, 88p NBS-TN-18-19

Descriptors: (*Natural radiofrequency interference, Data), Charts, Power measurement, Electrical measurement.

Radio noise measurements are being made at eighteen stations in a world-wide network operated in a co-operative program co-ordinated by the National Bureau of Standards. The results of these measurements for the months June, July, and August are given in this report. The tabulated values are based on three basic parameters of the noise; these are the mean power, the mean envelope voltage and the mean logarithm of the envelope voltage. (Author)
PB-195 218 HC$3.00 MF$0.65

QUARTERLY RADIO NOISE DATA DECEMBER, JANUARY, FEBRUARY, 1963-64.
Technical note,
National Bureau of Standards, Boulder, Colo. Central Radio Propagation Lab.
W. Q. Crichlow, R. T. Disney, and M. A. Jenkins.
25 Jan 65, 92p NBS-TN-18-21

Descriptors: (*Natural radiofrequency interference, Data), Charts, Power measurement, Electrical measurement.

Radio noise measurements are being made at eighteen stations in a world-wide network operated in a cooperative program coordinated by the National Bureau of Standards. The results of these measurements for the months of December, January, and February are given in this report. The tabulated values are based on three basic parameters of the noise; these are the mean power, the mean envelope voltage, and the mean logarithm of the envelope voltage. (Author)
PB-195 219 HC$3.00 MF$0.65

QUARTERLY RADIO NOISE DATA MARCH, APRIL, MAY 1962 AND CORRIGENDUM FOR TECHNICAL NOTES 18-1 THROUGH 18-11.
Technical note,
National Bureau of Standards, Boulder, Colo.
W. Q. Crichlow, R. T. Disney, and M. A. Jenkins.
9 Aug 62, 90p NBS-TN-18-14

Descriptors: (*Natural radiofrequency interference, Data), Charts, Power measurement, Electrical measurement.

Radio noise measurements were made at sixteen stations in a world-wide network supervised by the National Bureau of Standards. The results of the measurements for the period March, April, May 1962 are presented in the attached tables. These are based on three parameters of the noise: (1) the mean power, (2) the mean envelope voltage, and (3) the mean logarithm of the evelope voltage. (Author)
PB-195 273 HC$3.00 MF$0.65

21. PROPULSION AND FUELS

21B. Combustion and Ignition

COMBUSTION KINETICS OF PARTICULATE BORON.
Technical rept.,
Purdue Univ Lafayette Ind Project Squid Headquarters
C. M. Kelley, R. E. Williams, and A. Takemoto.
Sep 70, 25p Rept no. SQUID-TR-DEN-1-PU
Contract N00014-67-A-0226-0005
Prepared in cooperation with Denver Univ., Colo.

Descriptors: (*Boron, *Combustion), Combustion products, Burning rate, Ignition, Lasers, High-speed photography, Aerosols.
Identifiers: Squid project.

Initial combustion studies were performed with amorphous boron levitated in an electrostatic suspension cage, in an air atmosphere, and ignited by the output of a pulsed neodymium-doped glass laser operating at 1.06 microns. The particles are suspended in the quadrupole cage composed of four parallel rods, in the form of a square, and two end plates. Opposing pairs of the rods are connected and an AC potential of about 1500 volts is applied to the pairs. The frequency is adjusted to about 80 cycles. The lower plate of the system is held at 720 volts positive and the upper plate at 240 volts positive. The particles are charged with a Tesla coil and some fraction of the particles, having appropriate charge and mass, remain suspended in the field and become the subject for study. (Author)
AD-713 121 HC$3.00 MF$0.65

COMBUSTION KINETICS OF TETRAFLUOROETHYLENE.
Drexel Univ Philadelphia Pa Combustion Kinetics Lab
For primary bibliographic entry see Field 7D.
AD-713 144 HC$3.00 MF$0.65

ASYMPTOTIC ANALYSIS OF LAMINAR FLAME PROPAGATION FOR GENERAL LEWIS NUMBERS,
TRW Systems Group Redondo Beach Calif
Francis E. Fendell, and William B. Bush. 23 Jan 70, 11p AROD-6453:24-E
Contract DAHC04-67-C-0015
Prepared in cooperation with University of Southern California, Los Angeles.
Availability: Pub. in Combustion Science and Technology, v1 p421-428 1970.

Descriptors: (*Deflagration, Reaction kinetics), (*Flame propagation, Deflagration), Gas flow, Combustion.

The structure of a steady one-dimensional isobaric deflagration is examined for the case of a direct first-order one-step irreversible exothermic unimolecular decomposition under Arrhenius kinetics. In particular, the eigenvalue giving the speed of propagation of the laminar flame into the unburned gas is sought for constant Lewis number of order unity. The method of matched asymptotic expansion is invoked in the physically interesting limit of activation temperature large relative to the adiabatic flame temperature. The leading approximation for the eigenvalue is found to be a generalization of the result given by Zeldovich, Frank-Kamenetski, and Semenov for Lewis number unity. The first two terms in the asymptotic expansion for the eigenvalue yield an expression superior to any previously published. (Author)
AD-713 235

GASEOUS ILLUMINANT PYROTECHNIC SYSTEMS,
Picatinny Arsenal Dover N J Pyrotechnics Lab
For primary bibliographic entry see Field 19A.
AD-713 550 HC$3.00 MF$0.65

ON THE ACOUSTIC CONDUCTANCE OF THE BURNING SURFACE OF POWDER (Obakusticheskoi Provodimosti Goryashchei Poverkhrosti Porokha),
Army Foreign Science and Technology Center Washington D C
For primary bibliographic entry see Field 20A.
AD-713 753 HC$3.00 MF$0.65

EFFECT OF FUEL COMPOSITION ON EXHAUST EMISSIONS FROM A SPARK-IGNITION ENGINE.
Rept. of investigations,
Bureau of Mines, Washington, D.C.
R. D. Fleming. Sep 70, 74p* RI-7423

Descriptors: (*Air pollution, *Exhaust gases), (*Spark ignition engines, Air pollution), (*Aromatic compounds, *Antiknock additives), (*Automotive fuels, *Combustion products), Fuel additives, Xylenes, Aromatic monocyclic compounds, Gasoline, Chromatographic analysis, Carbon monoxide, Carbon dioxide, Nitrogen oxides, Hydrocarbons, Pentanes, Pentenes, Free radicals, Aldehydes.
Identifiers: *Pentene/2-4-4-trimethyl-2, *Pentane/2-2-4-trimethyl, Chemical reaction mechanisms, *Automobile exhaust.

A single-cylinder research engine was operated on pure hydrocarbons and simple (two-component) mixtures of pure hydrocarbons to study the effect of fuel composition on exhaust emissions from a spark-ignition engine. Used as fuels were three pure hydrocarbons that represented the primary hydrocarbon types present in commercial motor fuels: A paraffin (2,2,4-trimethylpentane), an olefin (2,4,4-trimethylpentene-2), and an aromatic (metaxylene). The engine was operated at the same equivalence ratio for all of the fuels used in the experiment. Exhaust gas samples were collected and quantitatively analyzed for carbon monoxide, carbon dioxide, hydrogen, nitrogen oxides, aldehydes, and hydrocarbons. The results of the exhaust gas analyses showed that ethylbenzene, 1-methyl-3-ethylbenzene, and 1-methyl-3-vinylbenzene were more abundant in the exhausts from either 2,2,4-trimethylpentane--m-xylene or 2,4,4-trimethylpentene-2--m-xylene fuel mixtures than in exhaust produced from m-xylene. Also, the pure 2,4,4-trimethylpentene-2 fuel produced smaller amounts of C2 to C7 olefins in the exhaust than that produced by the pure 2,2,4-trimethylpentane fuel. The exhaust from pure m-

xylene fuel contained aromatic hydrocarbons of higher molecular weight than the parent fuel. (Author)
PB-194 942 HC$3.00 MF$0.65

21C. Electric Propulsion

TAETIGKEITSBERICHTE 1969. FACHGEBIET 4: ANTRIEBE UND ENERGETIK (Activity Report 1969. Division 4: Propulsion and Energy Technique),
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Porz-Wahn (West Germany)
For primary bibliographic entry see Field 21E.
AD-713 210

21D. Fuels

TAETIGKEITSBERICHTE 1969. FACHGEBIET 4: ANTRIEBE UND ENERGETIK (Activity Report 1969. Division 4: Propulsion and Energy Technique),
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Porz-Wahn (West Germany)
For primary bibliographic entry see Field 21E.
AD-713 210

NAVAL FORCES AMPHIBIOUS ASSAULT BULK FUEL SYSTEM (AABFS)-LIGHTWEIGHT PIPE.
Naval Civil Engineering Lab., Port Hueneme, Calif.
For primary bibliographic entry see Field 13K.
AD-870 970 HC$3.00 MF$0.65

SEISMIC ACTIVITY IN SEPTEMBER 1969 NEAR THE RULISON NUCLEAR TEST SITE,
Coast and Geodetic Survey, Rockville, Md.
For primary bibliographic entry see Field 18C.
For abstract, see NSA 24 20.
CGS-746-5 HC$3.00 MF$0.65

THE IMPLICATIONS OF LEAD REMOVAL FROM AUTOMOTIVE FUEL.
Dept. of Commerce, Washington, D.C. Panel on Automotive Fuels and Air Pollution.
For primary bibliographic entry see Field 13B.
PB-194 880 HC$3.00 MF$0.65

PREDICTION OF SODIUM CONCENTRATION IN LIGNITE.
Rept. of investigations,
Bureau of Mines, Washington, D.C.
Manuel Gomez, Kathleen Hazen, and Everett A. Sondreal. Aug 70, 21p RI-7420

Descriptors: (*Lignite, *Ash content), (*Sodium oxides, Coal), (*Geochemical prospecting, *Coal mining), Contaminants, Chemical analysis, Statistical analysis.

Prediction models were constructed for seam elevation, overburden, and sodium concentration for a lignite deposit in Ward County, N. Dak. These models were developed by mathematical-statistical techniques using surface coordinates as independent variables to permit interpolation between drill holes. The results suggest that sodium concentration in lignite may be predicted in advance of mining. This information is helpful to mine planning, specifically, in scheduling production to deliver a uniform product to existing powerplants. (Author)
PB-194 940 HC$3.00 MF$0.65

EFFECT OF FUEL COMPOSITION ON EXHAUST EMISSIONS FROM A SPARK-IGNITION ENGINE.
Bureau of Mines, Washington, D.C.
For primary bibliographic entry see Field 21B.
PB-194 942 HC$3.00 MF$0.65

EFFECTS OF GASOLINE ADDITIVES ON CARBURETOR AND PCV SYSTEM PERFORMANCE AS THEY RELATE TO EXHAUST EMISSIONS.
Scott Research Labs., Inc., San Bernardino, Calif.
For primary bibliographic entry see Field 13B.
PB-195 143 HC$3.00 MF$0.65

21E. Jet and Gas Turbine Engines

TAETIGKEITSBERICHTE 1969. FACHGEBIET 4: ANTRIEBE UND ENERGETIK (Activity Report 1969. Division 4: Propulsion and Energy Technique),
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Porz-Wahn (West Germany)
Otto Lutz, Heinrich Kuehl, Guenter Spengler, Walter Luksch, and Armin Dadieu. 1969, 102p
Text in German.
Availability: Pub. in Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt-Jahresbericht 1969 102p No copies furnished.

Descriptors: (*Jet engines, Scientific research), (*Jet engine fuels, Scientific research), (*Lubricants, Scientific research), (*Rocket motors, Scientific research), (*Launch vehicles (Aerospace), Scientific research), (*Electric propulsion, Scientific research), (*Plasma physics, Scientific research), West Germany.

Der Inhalt: Institut fur Luftsaugende Antriebe; Institut fur Luftstrahlantriebe; Institut fur Flugtreib- und Schmierstoffe; Institut fur Chemische Raketenantriebe; Institut fur Chemische Raketenantriebe; Institut fur Reaktionskinetik; Institut fur Elektrische Antriebe und Energieversorgung; Institut fur Energiewandlung und Elektrische Antriebe; Institut fur Plasmadynamik.
AD-713 210

PARAMETERS AFFECTING THE MEASUREMENT OF AERO ENGINE EXHAUST SMOKE: A STATISTICAL ANALYSIS OF TEST DATA.
Technical rept. Sep 69-Feb 70,
Air Force Aero Propulsion Lab Wright-Patterson AFB Ohio
Donald L. Champagne. Aug 70, 66p* Rept no. AFAPL-TR-70-23

Descriptors: (*Smokes, Measurement), (*Aircraft engines, *Exhaust gases), Statistical analysis, Standards, Reflectometers.
Identifiers: Computer analysis, *Smoke abatement.

The report describes a computerized statistical analysis of test data from engine smoke measurements. The analysis indicated that test data can be used to arrive at statistically meaningful conclusions about four measuring system parameters. (Author)
AD-713 612 HC$3.00 MF$0.65

HIGH REYNOLDS NUMBER SUBSONIC AERODYNAMICS.
Advisory Group for Aerospace Research and Development, Paris (France).

Jun 70, 291p AGARD-LS-37-70
Conf- Lectures Held At Rhode-saint-genese, Belgium, 21-25 Apr. 1969, Sponsored Jointly By Agard and Von Karman Inst.

Descriptors: *Aircraft design, *Conferences, *Engine design, *Reynolds number, *Subsonic aircraft, *Turbine engines, Aerodynamics, Aircraft models, Bibliographies, Computerized design, Engine parts, Scale effect, Transonic flow.

For abstract, see STAR 08 21.
N70-37753 HC$3.00 MF$0.65

21F. Nuclear Propulsion

MARINE ATOMIC STEAM-GENERATING INSTALLATIONS,
Naval Intelligence Command Alexandria Va Translation Div
I. I. Afrikantov, and F. M. Mitenkov. 22 Jul 69, 442p Rept no. NIC-Trans-2858
Trans. of mono. Sudovye Atomnye Paroproizvoditelnye Ustanovki, Leningrad, 1965.

Descriptors: (*Marine nuclear propulsion, *Nuclear power plants), Boiling water reactors, Liquid metal cooled reactors, Organic cooled reactors, Gas-cooled reactors, Reactor system components, Reactor control, Reactor cores, Reactor fuels, Shielding, Maintenance, Reliability, Reactor safety systems.
Identifiers: Translations.

The report contains Principal schematics for shipboard atomic energy and steam generating installations; Principles of operation and nuclear reactor arrangements; Structural members of reactors and control and safety system drive mechanisms; Steam generators for marine atomic steam generating plants (PPU); Primary loop circulating pumps for marine atomic steam generating plants; Auxiliary equipment for marine atomic steam generating plants; Materials used in marine atomic steam generating plants; Biological shielding for marine atomic steam generation plants; Control of a marine atomic steam generating plant; Some problems involved in the maintenance and safety of marine atomic steam-generating plants; and A procedure for planning marine atomic steam-generating plants.
AD-713 426 HC$3.00 MF$0.65

COUNTERMEASURES AGAINST VIBRATION AND OSCILLATIONS OF SHIP REACTORS,
Division of Technical Information Extension (AEC), Oak Ridge, Tenn.
For primary bibliographic entry see Field 13J.
For abstract, see NSA 24 20.
CONF-700211-5 HC$3.00 MF$0.65

21H. Rocket Motors and Engines

TAETIGKEITSBERICHTE 1969. FACHGEBIET 4: ANTRIEBE UND ENERGETIK (Activity Report 1969. Division 4: Propulsion and Energy Technique),
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Porz-Wahn (West Germany)
For primary bibliographic entry see Field 21E.
AD-713 210

COOLANT FLOW EFFECTS ON THE PERFORMANCE OF A CONICAL PLUG NOZZLE AT MACH NUMBERS FROM 0 TO 2.0.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
F. C. Chenoweth, and R. J. Jeracki. Sep 70, 50p NASA-TM-X-2076, E-5552
Contract 720-03

Descriptors: *Conical nozzles, *Film cooling, *Flow geometry, *Graphs (charts), *Plugs, Engine coolants, Nozzle design, Nozzle efficiency.

For abstract, see STAR 08 21.
N70-38751 HC$3.00 MF$0.65

21I. Rocket Propellants

REVIEW OF RECENT RUSSIAN WORK ON DOUBLE BASE PROPELLANTS,
South Carolina Univ Columbia Coll of Engineering

A. Datta, N. P. Suh, and C. L. Thompson, Jr. Jul 69, 27p
Grant DA-ARO (D)-31-124-G1120

Descriptors: (*Double base rocket propellants, Reviews), Solid rocket propellants, Combustion, Pyrolysis, Burning rate, Thermal radiation, Reaction kinetics, USSR.

The report is a state of the art review of developments made by the USSR in combustion research on double base rocket propellants.
AD-713 186 HC$3.00 MF$0.65

THE DETERMINATION OF ALUMINUM AND CHLORINE IN COMPOSITE PROPELLANTS BY NON-DESTRUCTIVE ACTIVATION ANALYSIS USING A MIXTURE OF 14/5 MEV AND SLOW NEUTRONS.
White Sands Missile Range N Mex
A. E. Richardson, and Alex Harrison. 1970, 12p

Descriptors: (*Solid rocket propellants, *Radioactivation analysis), (*Aluminum, Radioactivation analysis), (*Chlorides, Radioactivation analysis), (*Non-destructive testing, Solid rocket propellants), Neutron beams, X-ray spectroscopy.
Identifiers: *Neutron activation analysis, X-ray fluorescence analysis.

Aluminum and chlorine can be determined simultaneously with a precision of better than plus or minus 1% by activation analysis utilizing a mixture of 14.5 MeV and slow neutrons. The accuracy compares favorably with X-ray fluorescence and indicates that activation analysis can be a valuable method for the quality control of solid composite propellants. (Author)
AD-713 575 HC$3.00 MF$0.65

WAVE PROPAGATION IN AN INFINITE ELASTIC PLATE IN CONTACT WITH AN INVISCID LIQUID LAYER.
Watervliet Arsenal N Y
For primary bibliographic entry see Field 20K.
AD-713 635

PROPERGOLS HAUTEMENT ENERGETIQUES (High Energy Propellants).
Agardograph rept.,
Advisory Group for Aerospace Research and Development Paris (France)
P. Tavernier, J. Boisson, and B. Crampel. 1970, 340p Rept no. AGARD-AG-141-70
NATO furnished.

Descriptors: (*Rocket propellants, *Reviews), Liquid rocket propellants, Solid rocket propellants, Hybrid rocket propellants, Burning rate, Combustion, Hydrides, Chemical properties, Physical properties, Boranes, Hydrazine derivatives, Metals, Triazines, France.

Contents: Caracteristiques energetiques des propergols; Chimie des constituants; Propergols hautement energetiques; Problemes specifiques des propergols hautement energetiques.
AD-713 709 HC$3.00 MF$0.65

RAPID LINEAR PYROLYSIS OF COMPOSITE SOLID PROPELLANT INGREDIENTS.
Vitro Labs., Silver Spring, Md.
For primary bibliographic entry see Field 7C.
For abstract, see STAR 08 21.
N70-37786 HC$3.00 MF$0.65

STATISTICAL ANALYSIS OF PROJECT PYRO LIQUID PROPELLANT EXPLOSION DATA.
Bellcomm, Inc., Washington, D. C.
G. R. Andersen, and P. Gunther. 23 Jul 69, 211p
NASA-CR-113114, TM-69-1033-3
Contract NASW-417

Descriptors: *Cryogenic rocket propellants, *Explosions, *Propellant tests, *Regression analysis, Failure modes, Graphs (charts), Ignition, Least squares method, Propellant storage, Spilling.

For abstract, see STAR 08 21.
N70-37958 HC$3.00 MF$0.65

THERMAL DECOMPOSITION AND EXPLOSION OF AMMONIUM PERCHLORATE AND AMMONIUM PERCHLORATE PROPELLANT UP TO FIFTY KILOBARS.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
For primary bibliographic entry see Field 7B.
For abstract, see STAR 08 21.
N70-38503 HC$3.00 MF$0.65

22. SPACE TECHNOLOGY

22A. Astronautics

TAETIGKEITSBERICHTE 1969. FACHGEBIET 5: ELEKTRONIK (Activity Report 1969. Division 5. Electronics),
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Porz-Wahn (West Germany)
For primary bibliographic entry see Field 9C.
AD-713 211

TAETIGKEITSBERICHTE 1969. FAHGEBIET 6: FLUGRAUMPHYSIK, RAUMSIMULATION, FLUGMEDIZIN (Activity Report 1969. Division 6: Space Flight Physics, Space Simulation, Flight Medicine),
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Porz-Wahn (West Germany)
Hans Gerhard Mueller, and Siegfried Ruff. 1969, 29p
Text in German.
Availability: Pub. in Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt-Jahresbericht 1969 29p. No copies furnished.

Descriptors: (*Space flight, Scientific research), (*Atmosphere, Scientific research), (*Aviation medicine, Scientific research), Reports, Infrared radiation, Meteorological radar, Clear air turbulence, Aurorae, Solar radiation, Space environmental conditions, Space simulation chambers, Solar cells, Space medicine, Decompression sickness, West Germany.
Identifiers: Helgoland underwater laboratory.

The Institut fur Physik der Atmosphare investigates problems of environmental conditions for aircraft, flying bodies and rockets, as far as moving within the earth's atmosphere. Main subjects of research are problems of physical meteorology, the energy balance of the atmosphere, the investigation of the incoming and outgoing radiation as well as the investigation of the herewith connected problems concerning measuring technique. The Institut fur Raumsimulation runs laboratories for carrying out tests under the environmental conditions of outer space. Besides of general problems of aerospace medicine and biology, the Institut fur Flugmedizin studies problems of aerospace physiology and physiology of effort, of mechanical altitude effects and Caisson research, problems of stay under high pressure with different gas mixtures, of the physiological chemistry and aerospace psychology. (Author)
AD-713 212

SPACE TRANSPORTATION SYSTEM TECHNOLOGY SYMPOSIUM. VOLUME 1 - AEROTHERMODYNAMICS AND CONFIGURATIONS.
National Aeronautics and Space Administration, Washington, D. C.
For primary bibliographic entry see Field 22B.
For abstract, see STAR 08 21.
N70-37826 HC$10.00 MF$0.65

LANDING IMPACT ATTENUATION FOR NON-SURFACE- PLANING LANDERS.
Hughes Aircraft Co., Culver City, Calif.
R. H. Jones. Apr 70, 47p NASA-SP-8046
Spon- Sponsored By Nasa

Descriptors: *Aerospace engineering, *Impact loads, *Landing modules, Deceleration, Dynamic stability, Impact acceleration, Payloads, Touchdown.

For abstract, see STAR 08 21.
N70-38294 HC$3.00 MF$0.65

BACKGROUND OF A LUNAR FLIGHT.
Achtergrond Van Een Maanreis
Institut D Aeronomie Spatiale de Belgique, Brussels.
E. Aerts. 1970, 79p
Lang- in Dutch, English Summary Seri- Its Aeronomica Acta No. F-16-1970

Descriptors: *Apollo project, *Lunar flight, Apollo spacecraft, Lunar exploration, Lunar landing, Lunar module, Lunar soil, Lunar trajectories, Reviewing.

For abstract, see STAR 08 21.
N70-38483 HC$3.00 MF$0.65

LUNAR ORBITER FLIGHT VIBRATION DATA AND COMPARISONS WITH ENVIRONMENTAL SPECIFICATIONS.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
S. A. Clevenson. Sep 70, 69p NASA-TN-D-6006, L-6594
Contract 814-11-00-03

Descriptors: *Flight tests, *Lunar orbiter, *Vibration measurement, *Vibration tests, Atlas agena launch vehicles, Environmental tests, Ground tests, Regression analysis, Spacecraft launching, Specifications.

For abstract, see STAR 08 21.
N70-38502 HC$3.00 MF$0.65

REQUIREMENTS ANALYSIS FOR A MANNED SPACEFLIGHT PROGRAMMING LANGUAGE AND COMPILER.
Intermetrics, Inc., Cambridge, Mass.
1969, 48P NASA-CR-108634, MSC-01845
Contract NAS9-10542

Descriptors: *Compilers, *Machine oriented languages, *Manned space flight, *Systems engineering, Checkout, Coding, Language programming, Requirements.

For abstract, see STAR 08 21.
N70-38950 HC$3.00 MF$0.65

22B. Spacecraft

BOMS II, BUCKLING OF STIFFENED MULTILAYERED CIRCULAR CYLINDRICAL SHELLS WITH DIFFERENT ORTHOTROPIC MODULI IN TENSION AND COMPRESSION.
Aerospace Corp San Bernardino Calif San Bernardino Operations
For primary bibliographic entry see Field 20K.
AD-713 113 HC$3.00 MF$0.65

SIMULATION WITH MINIMUM EQUIPMENT OF RANDOM VIBRATION INDUCED BY COMPLEX EXCITATION.
Houston Univ Tex Dept of Mechanical Engineering
For primary bibliographic entry see Field 20K.
AD-713 141 HC$3.00 MF$0.65

TAETIGKEITSBERICHTE 1969. FACHGEBIET 3: FESTIGKEIT, WERKSTOFFE, BAUWEISEN

(Activity Report 1969. Division 3: Strength, Materials, Construction Methods),
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Porz-Wahn (West Germany)
Wilhelm Thielemann, Hans Foersching, Friedrich-Carl Althof, J. Kowalewski, and Ulrich Huetter.
1969, 47p
Text in German.
Availability: Pub. in Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt-Jahresbericht 1969 47p. No copies furnished.

Descriptors: (*Airframes, Materials), (*Spacecraft, Materials), Composite materials, Mechanical properties, Space environmental conditions, Radiation hazards, Aerodynamic loading, Aircraft, Space propulsion, West Germany.

The Institut fur Flugzeugbau is concerned with theoretical and experimental investigations of strength and static stability of aerospace structures. The Abteilung Aeroelastik works on the theoretical and experimental solution of aeroelastic and elastomechanic problems of aircraft and spacecraft. The field of activity of the Institut fur Werkstoff-Forschung comprises material problems connected with the modern methods of construction and the propulsions of aircraft and spacecraft and their exposure to extreme service conditions. The Institut fur Festigkeit (Strength and Dynamics) was engaged in theoretical and experimental research on structure mechanics. Main subjects of research of the Institut fur Bauweisen- und Konstruktionsforschung are scientific investigations on the weight-optimal utilization of fiber-reinforced composite materials and that for high-loadable primary structures and component parts in aircraft and spacecraft construction. (Author)
AD-713 209

A NEW SATELLITE MULTIPLE ACCESS TECHNIQUE.
Rome Air Development Center Griffiss AFB N Y
For primary bibliographic entry see Field 17B.
AD-713 674 HC$3.00 MF$0.65

SPACE TRANSPORTATION SYSTEM TECHNOLOGY SYMPOSIUM. VOLUME 1 - AEROTHERMODYNAMICS AND CONFIGURATIONS.
National Aeronautics and Space Administration, Washington, D. C.
Jul 70, 575p NASA-TM-X-52876
Conf- Symp. Held At Cleveland, Ohio, 15-17 Jul. 1970

Descriptors: *Aerodynamic stability, *Conferences, *Heat transfer coefficients, *Hypervelocity flow, *Space shuttles, *Spacecraft configurations, Boundary layer transition, Horizontal spacecraft landing, Lifting reentry vehicles.

For abstract, see STAR 08 21.
N70-37826 HC$10.00 MF$0.65

STATISTICAL THEORY OF INELASTIC NEUTRON ENERGY SPECTRA.
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
For primary bibliographic entry see Field 18F.
For abstract, see STAR 08 21.
N70-38168 HC$3.00 MF$0.65

APOLLO ABLATOR THERMAL PERFORMANCE AT SUPERORBITAL ENTRY VELOCITIES.
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
D. M. Curry, and E. W. Stephens. Sep 70, 27p
NASA-TN-D-5969, MSC-S-247
Contract 914-11-20-11-72

Descriptors: *Ablation, *Apollo spacecraft, *Reentry physics, *Thermodynamics, Charring, Heat shielding, Mathematical models, Orbital velocity, Thermocouples, Thermophysical properties.

For abstract, see STAR 08 21.
N70-38377 HC$3.00 MF$0.65

REAL-TIME DIGITAL-COMPUTER-HARDWARE SIMULATION OF A SPACECRAFT WITH CONTROL-MOMENT-GYROSCOPE STABILIZATION.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
C. R. Keckler, R. G. Kyle, R. W. Will, and C. T. Woolley. Sep 70, 53p NASA-TM-X-2069, L-6555
Contract 965-21-00-01

Descriptors: *Apollo telescope mount, *Computerized simulation, *Control moment gyroscopes, *Spacecraft stability, Feedback control, Real time operation.

For abstract, see STAR 08 21.
N70-38789 HC$3.00 MF$0.65

AERODYNAMIC CHARACTERISTICS OF A FIXED-WING MANNED SPACE SHUTTLE CONCEPT AT A MACH NO. OF 6.0.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
D. R. Stone. Sep 70, 28p NASA-TM-X-2049, L-7234
Contract 124-64-02-05

Descriptors: *Aerodynamic characteristics, *Fixed wings, *Space shuttles, *Spacecraft configurations, Hypersonic vehicles.

For abstract, see STAR 08 21.
N70-38790 HC$3.00 MF$0.65

AEROSPACE NUCLEAR SAFETY PROGRAM.
Sandia Labs., Albuquerque, N. Mex.
For primary bibliographic entry see Field 18N.
For abstract, see NSA 24 20.
SC-PR-70-435 HC$3.00 MF$0.65

FLUSH-MOUNTED ELECTROSTATIC PROBE IN THE PRESENCE OF NEGATIVE IONS,
Sandia Labs., Albuquerque, N. Mex.
For primary bibliographic entry see Field 14B.
For abstract, see NSA 24 20.
SC-RR-70-413 HC$3.00 MF$0.65

22C. Spacecraft Trajectories and Reentry

PROBABILITY OF RESCUE SUCCESS OF EMERGENCY RETURN OF SPACECRAFT.
Technical rept. Jan-Aug 69,
Aerospace Corp El Segundo Calif Systems Engineering Operations
S. T. Chu, and A. R. Nagy, Jr. 15 Aug 70, 102p
Rept no. TR-0059 (6758-06)-1 SAMSO-TR-70-373
Contract F04701-70-C-0059

Descriptors: (*Manned spacecraft, Rescues), (*Rescues, Probability), Mathematical analysis, Recovery, Space capsules, Space stations, Low-orbit trajectories, Soft landings, Atmosphere entry.
Identifiers: *Space rescues.

The problem of successful emergency return of spacecraft or escape capsule from low earth orbit is investigated by combining the orbital waiting characteristics of the spacecraft and the capabilities of surface recovery forces. The analysis of return probability of spacecraft to multiple recovery areas, including the factors of local time constraints and redundant access, is summarized. The probability of successful rescue is developed by matching of two independents: the return from orbit by the spacecraft and the search and rescue by aircraft. Two retrieval methods are considered: water pickup and air snatch. The method of analysis and information presented have broad applicability in program planning and conceptual studies of future manned space systems. Sample results of typical applications are included. (Author)
AD-713 106 HC$3.00 MF$0.65

OPTIMALE DREIDIMENSIONALE GLEITFLUBBAHNEN BEIMEINTRITT IN PLANETENATMOSPHAEREN (Optimal Three-Dimensional Flight Paths for Entry into Planetary Atmospheres),
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Oberpfaffenhofen (West Germany)
E. D. Dickmanns. 1970, 8p Rept no. DFVLR-Sonderdruck-49
Text in German; attached summary in English.
Availability: Pub. in Raumfahrtforschung, n3 p89-95 May/Jun 70. No copies furnished.

Descriptors: (*Atmosphere entry, Descent trajectories), (*Planetary atmospheres, Exploration), Polar orbit trajectories, Transfer trajectories, West Germany.

Three examples for optimal 3-dimensional flight paths are discussed: Maximum lateral range descent from earth orbit; influence of altitude dependency of vehicle polar. Synergetic plane change maneuver for close-earth circular orbits: influence of altitude dependency of vehicle polar, and influence of load factor limitation. A combined braking-plane change maneuver for the exploration of planets with high density atmospheres.
AD-713 646

A METHOD FOR COMPUTING EXTREMAL MAXIMUM-RANGE THRUST-LIMITED ROCKET TRAJECTORIES WITH APPLICATION TO LUNAR TRANSPORT.
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
E. S. Armstrong, A. G. Childs, and A. T. Markos. Sep 70, 44p NASA-TN-D-5981, L-7114
Contract 125-19-08-04

Descriptors: *Lunar trajectories, *Optimal control, *Rocket vehicles, *Trajectory optimization, Algorithms, Boundary value problems, Extremum values, Kepler laws, Maximum principle, Nonlinear programming, Pontryagin principle, Thrust-weight ratio.

For abstract, see STAR 08 21.
N70-38533 HC$3.00 MF$0.65

ANALYSIS OF LAUNCH WINDOWS FROM ELLIPTICAL ORBITS FOR REPRESENTATIVE MARS MISSIONS.
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
L. A. Manning, and B. L. Swenson. Sep 70, 26p
NASA-TM-X-2093, A-3638
Contract 130-06-05-02-15

Descriptors: *Elliptical orbits, *Launch windows, *Mars probes, *Spacecraft propulsion, Parking orbits, Planetary orbits, Round trip trajectories, Velocity, Venus probes.

For abstract, see STAR 08 21.
N70-38549 HC$3.00 MF$0.65

OPTIMUM TRAJECTORIES TO CIRCULAR SYNCHRONOUS EQUATORIAL ORBIT FOR SMALLER-THAN-OPTIMUM APOGEE MOTORS.
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

O. F. Spurlock, and F. Teren. Sep 70, 28p NASA-TN-D-5998, E-5732
Contract 180-06

Descriptors: *Apogees, *Circular orbits, *Motors, *Optimization, *Trajectory analysis, Applications technology satellites, Calculus of variations, Numerical integration.

For abstract, see STAR 08 21.
N70-38570 HC$3.00 MF$0.65

22D. Spacecraft Launch

Vehicles and Ground Support

TAETIGKEITSBERICHTE 1969. FACHGEBIET 4: ANTRIEBE UND ENERGETIK (Activity Report 1969. Division 4: Propulsion and Energy Technique),
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Porz-Wahn (West Germany)
For primary bibliographic entry see Field 21E.
AD-713 210

DESIGN SENSITIVITIES OF MULTISTAGE LAUNCH VEHICLES.
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
D. W. Fellenz. 26 Sep 69, 14p NASA-TM-X-53944, MSFC-ASO-IN-1-67

Descriptors: *Launch vehicles, *Sensitivity, *Spacecraft design, Factor analysis, Graphs (charts), Multistage rocket vehicles, Research and development, Structural weight.

For abstract, see STAR 08 21.
N70-38380 HC$3.00 MF$0.65

REPORT LOCATOR LIST

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5I	AD-814 862	20H	COO-264-551	18J	GEAP-10010-24	7C	N70-38192
11B	AD-815 672	20H	COO-264-552	18I	GEAP-10028-33	6H	N70-38291
7D	AD-822 208	20H	COO-264-553	18I	GEAP-13598	6H	N70-38292
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9B	AD-844 551	20B	COO-588-19	18J	IAEA/HPR-9	4B	N70-38298
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8B	AD-853 884	11F	COO-916-17	18I	IN-1384	7D	N70-38311
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